

Air cleaner		KLT110		KLT160	
Element type		Oiled, polyurethane foam			
Lubrication					
System type		Forced pressure, wet sump			
Filter type(s)		Gauze screen and centrifugal		Gauze strainer	
Pump type		Trochoid		Trochoid	
Oil capacity		1.1 litre (2.3 US pint)		1.7 litre (3.6 US pint)	
Fuel tank		KLT200 A1	KLT200 A2/A3	KLT200 A4(A)/B/C	
Capacity		11.0 litre (2.9 US gal)	9.7 or 12.0 litre (2.5 or 3.1 US gal)	12.0 litre (3.1 US gal)	
Carburetor		KLT200 A1	KLT200 A2 /A3 to 522924	KLT200 A3 522925 to 527011	KLT200 A3 527012 to 527937
Make	Keihin	Keihin	Keihin	Keihin	
Type	PW 26	PW 26	PW 26	PW 26	
ID no	1326	1326	1492	1492	
Pilot jet	35	35	42	42	
Main jet	105	98	118	110	
			(110 optional)		
Air jet	N/Av	100	160	160	
Jet needle	N040	N040	N04E	N04E	
Needle clip position (grooves from top)	4th	4th	3rd	3rd	
			(4th optional)		
Throttle valve cutaway	3.0	3.0	3.0	3.0	
Pilot mixture screw (turns out from fully in)	1 ³ / ₄	1 ³ / ₈	1 ⁷ / ₈	1 ⁷ / ₈	
Fast idle link-to-cam clearance	N/App	N/App	2 to 2.5 mm (0.078 to 0.098 in)	2 to 2.5 mm (0.078 to 0.098 in)	
Fuel level	4 to 6 mm (0.16 to 0.23 in)	6 mm (0.23 in)	3.5 mm (0.13 in)	3.5 mm (0.13 in)	
Carburetor		KLT200 A3 527938 to 529199	KLT200 A3 529200 on /A4/A4A	KLT200 B1 /C1	KLT200 C2
Make			Keihin	Keihin	Mikuni
Type		PW 26	PW 26	PW 26	VM 22 SS
ID no		1594	1701	1811	N/Av
Pilot jet		42	42	42	3.5
Main jet		110	110	105	102.5
Air jet		160	160	160	N/Av
Jet needle		N04E	N04E	N04E	5M01
Needle clip position (grooves from top)		3rd	3rd	3rd	N/Av
Needle jet		N/App	N/App	N/App	0.2
Throttle valve cutaway		3.0	3.0	3.0	3.0
Pilot mixture screw (turns out from fully in)		2	2	2	2
Fast idle link-to-cam clearance		2 to 2.5 mm (0.078 to 0.098 in)	2 to 2.5 mm (0.078 to 0.098 in)	2 to 2.5 mm (0.078 to 0.098 in)	N/App
Float height		N/Av	N/Av	20 mm (0.78 in)	N/Av
Fuel level		1.5 mm (0.06 in)	1.5 mm (0.06 in)	1.5 mm (0.06 in)	N/Av
Fuel pump		KLT200 A1, A2, A3	KLT200 A4, A4A	KLT200 B, C	
Output per minute		360 cc (12 fl oz)	500 cc (17 fl oz)	350 cc (12 fl oz)	
Service limit		180 cc (6 fl oz)	300 cc (10 fl oz)	300 cc (10 fl oz)	
Delivery pressure		6 psi (0.42 kg/cm ²)	2.8 to 4.3 psi (0.20 to 0.30 kg/cm ²)	1 to 21 psi (0.07 to 1.48 kg/cm ²)	
Service limit		1 psi (0.07 kg/cm ²)	0.7 psi (0.05 kg/cm ²)	0.7 psi (0.05 kg/cm ²)	
Air cleaner		KLT200 – all models			
Element type		Oiled, polyurethane foam			
Lubrication					
System type		Forced pressure, wet sump			
Filter types		Gauze strainer and paper element			
Oil capacity:					
At filter renewal/engine rebuild		1.4 litre (2.9 US pint)			
At oil change		1.1 litre (2.3 US pint)			
Pump:					
Type		Trochoid			
Rotor side clearance		0.02 to 0.08 mm (0.0008 to 0.003 in)			
Service limit		0.12 mm (0.005 in)			
Outer rotor to inner rotor clearance		Less than 0.15 mm (0.006 in)			
Service limit		0.20 mm (0.008 in)			

Outer rotor to pump body clearance	0.15 to 0.23 mm (0.006 to 0.009 in)
Service limit	0.30 mm (0.012 in)
Outer rotor overall diameter	40.51 to 40.56 mm (1.595 to 1.597 in)
Service limit	40.45 mm (1.592 in)
Pump body inside diameter	40.71 to 40.74 mm (1.603 to 1.604 in)
Service limit	40.80 mm (1.606 in)
System pressure (4000 rpm/90°C):	
Engine no 048944 and under	0.2 kg/cm ² (2.8 psi)
Engine no 048945 and above	0.4 kg/cm ² (5.6 psi)
Fuel tank	
Capacity	KLT250 model 12.0 litre (3.1 US gal)
Carburetor	
Make	Keihin
Type	PW 26
ID no:	
250 A1	1489/1595
250 A2, C1, P1	1812
Pilot jet	42
Pilot air jet	120
Pilot outlet	0.9 mm (0.035 in)
Pilot mixture screw (turns out from fully in)	A1-17/8 (2 ¹ / ₄ to 2 ³ / ₈ optional) all other models – 2 ¹ / ₄
Main jet	110
Main air jet	160
Needle jet	3.2 mm (0.126 in)
Jet needle	N04E
Needle clip position (grooves from top)	3rd (4th optional – A1 only)
Bypass outlet	1.1 mm (0.043 in)
Throttle valve cutaway	3.0
Fuel level	1.5 mm (0.059 in)
Float height	20 mm (0.787 in)
Float valve	1.2 mm (0.047 in)
Fast idle link-to-cam clearance	2 to 2.5 mm (0.078 to 0.098 in)
Engine idling speed	Approx 1250 rpm
Fuel pump	
Output per minute:	
250 A1	360 cc (12 fl oz)
250 A2/C/P	350 cc (12 fl oz)
Service limit:	
250 A1	180 cc (6 fl oz)
250 A2/C/P	300 cc (10 fl oz)
Delivery pressure:	
250 A1	6 psi (0.42 kg/cm ²)
250 A2/C/P	1 to 21 psi (0.07 to 1.48 kg/cm ²)
Service limit:	
250 A1	1 psi (0.07 kg/cm ²)
250 A2/C/P	0.7 psi (0.05 kg/cm ²)
Air cleaner	
Element type	Oiled, polyurethane foam
Lubrication	
System pressure	0.4 kg/cm ² (5.6 psi) at 4000 rpm/90°C
All remaining lubrication system specifications are as for KLT200 models	

1 General information

On KLT110 and 160 models the fuel tank is mounted on the frame top tube in the usual motorcycle position. Gasoline is fed to the carburetor by gravity. On KLT200 and 250 models the tank is located at the rear of the frame, between the rear wheels and a fuel pump is therefore required to supply the carburetor. KLT200 A1, A2, A3 and KLT250 A1 models are fitted with a vacuum-operated pump, all other models with electric pumps. A filter is fitted in the fuel feed line to remove particles of dirt (except KLT250 A1).

The air cleaner is mounted in a casing to the rear of the carburetor

and uses an oil-wetted polyurethane foam element.

The lubrication system comprises a crankcase reservoir, from which oil is drawn through a gauze strainer to the gear-driven oil pump which feeds the oil under pressure to the engine components. KLT110 models are fitted with a centrifugal oil filter in the clutch housing, while KLT200 and 250 models are fitted with a renewable paper filter element. This element is fitted on a by-pass valve which opens to permit the engine oil supply to be maintained if the filter is too clogged to pass oil in sufficient quantity.

Note that all items that are serviced as part of routine maintenance are included in Chapter 1.

2 Fuel tank – removal, inspection, cleaning and installation

Caution: Perform fuel system service procedures in a well-ventilated area, free from open flames (cigarettes, pilot lights, sparks, etc). Do not smoke and take all suitable precautions to prevent the risk of fire.

KLT110 and 160 models

- 1 Remove the seat. See Chapter 5.
- 2 Turn off the fuel tap and pull the fuel hose off the tap.
- 3 Remove the single rear mounting bolt with its lock washer and flat washer.
- 4 Lift the tank at the rear and pull it backwards to release it.
- 5 Flush out the tank with high flash-point solvent to remove any dirt or water.

6 Check the tank for leaks or other damage. Repairs may be possible but are for the expert only.

7 Check that the mounting rubbers are in good condition. Renew any that are cracked, worn or perished.

8 Installation is the reverse of removal. Check for fuel leaks.

KLT200 models

9 Remove the seat and rear fender. See Chapter 5.

10 Place a container of sufficient capacity under the front of the tank, pull the fuel hose off the tank and allow the tank to drain fully.

11 Pull the vent hose off the tank top surface.

12 Remove the single rear mounting bolt and the two front bracket bolts.

13 Tilt the tank and pull it out of the frame to the rear.

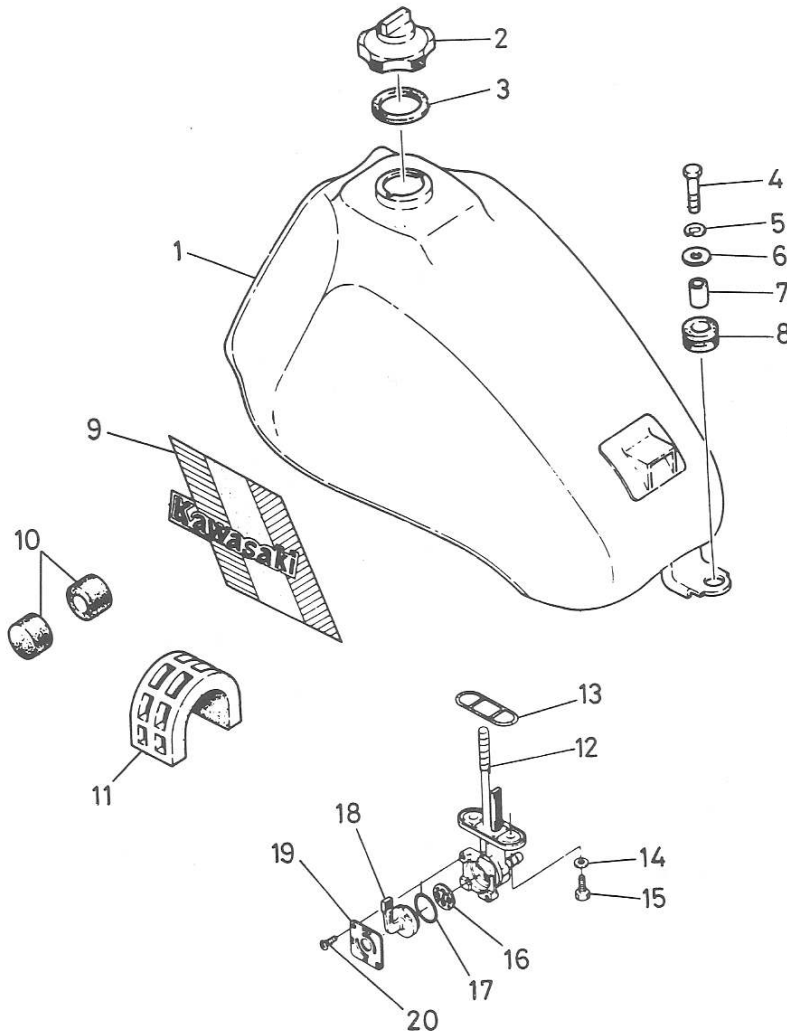


Fig. 3.1 Fuel tank and tap – KLT110 and 160 (Sec 2)

- | | | | |
|-----------------|------------|-------------|-----------|
| 1 Fuel tank | 6 Washer | 11 Damper | 16 Gasket |
| 2 Filler cap | 7 Collar | 12 Fuel tap | 17 O-ring |
| 3 Gasket | 8 Damper | 13 O-ring | 18 Lever |
| 4 Bolt | 9 Emblem | 14 Washer | 19 Plate |
| 5 Spring washer | 10 Dampers | 15 Bolt | 20 Screw |

- 14 Flush out the tank with high flash-point solvent to remove any dirt or water.
- 15 Check the tank for leaks or other damage. Repairs may be possible but are for the expert only.
- 16 Check that the mounting rubbers are in good condition and renew any that are cracked, worn or perished.
- 17 Installation is the reverse of removal. Check that the damper is in place on the frame tube below the tank. Refill the tank and check for fuel leaks.

KLT250 model

- 18 Remove the seat, trunk and rear fender. See Chapter 5.
- 19 Place a container of sufficient capacity under the front of the tank, pull the fuel hose off the tap, switch the tap on, and allow the tank to drain fully.
- 20 Remove the tail light bracket.

- 21 Remove their mounting bolts and withdraw both mounting brackets.
- 22 Pull the vent hose fitting out of the tank.
- 23 Tilt the tank to the rear and slacken the filler hose lower clamp, then pull the hose off the tank.
- 24 Pull the tank out of the frame to the rear.
- 25 Flush out the tank with high flash point solvent to remove any dirt or water.
- 26 Check the tank for leaks or other damage. Repairs may be possible but are for the expert only.
- 27 Check the fuel filler hose. If it is cracked, split, cut or damaged or deteriorated in any way it must be renewed. Renew the clamps if they are damaged or worn.
- 28 Check that the mounting rubbers are in good condition and renew any that are damaged, worn or perished.
- 29 Installation is the reverse of removal. Check that the dampers are in place on the frame tube below the tank. Refill the tank and check for fuel leaks.

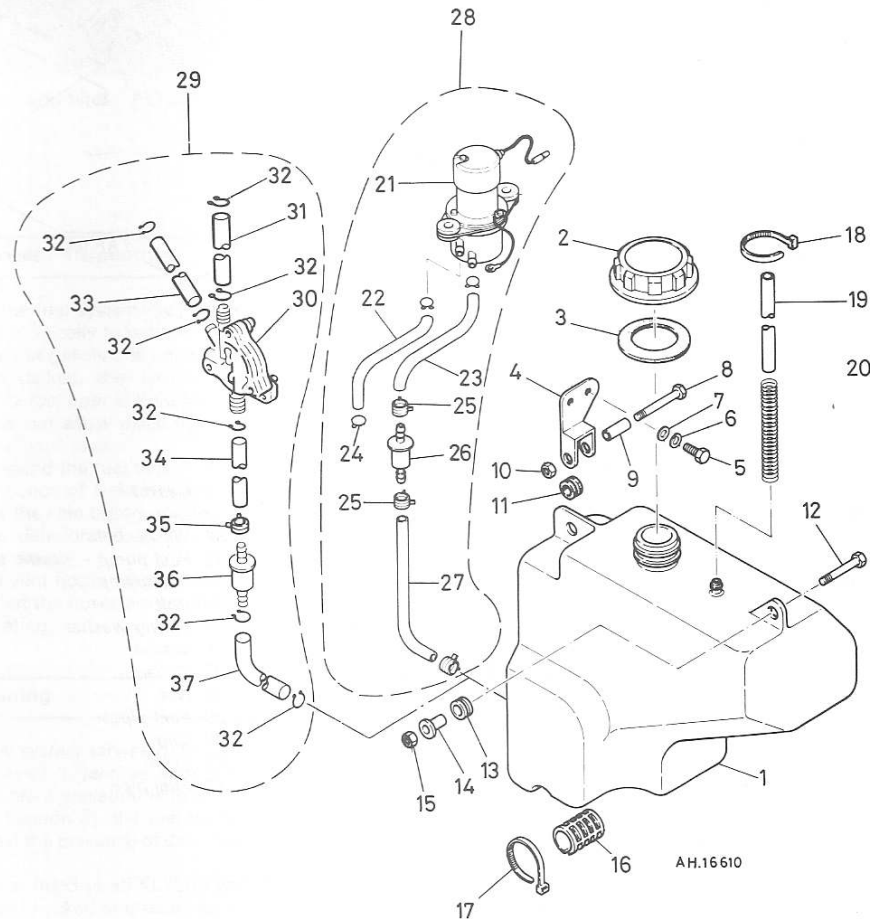


Fig. 3.2 Fuel tank and pump – KLT200 (Sec 2)

- | | | | |
|-----------------|------------------|---|---------------------|
| 1 Fuel tank | 11 Grommet | 21 Electric fuel pump | 30 Vacuum fuel pump |
| 2 Filler cap | 12 Bolt | 22 Fuel hose | 31 Fuel pipe |
| 3 Gasket | 13 Grommet | 23 Fuel hose | 32 Clip |
| 4 Bracket | 14 Collar | 24 Clip | 33 Fuel pipe |
| 5 Bolt | 15 Nut | 25 Clip | 34 Fuel pipe |
| 6 Spring washer | 16 Damper | 26 Filter | 35 Clip |
| 7 Washer | 17 Tie | 27 Fuel hose | 36 Filter |
| 8 Bolt | 18 Tie | 28 Fuel pump assembly – A4, A4A, B1, C1, C2 | 37 Fuel pipe |
| 9 Collar | 19 Breather hose | 29 Fuel pump assembly – A1, A2, A3 | |
| 10 Nut | 20 Coil spring | | |

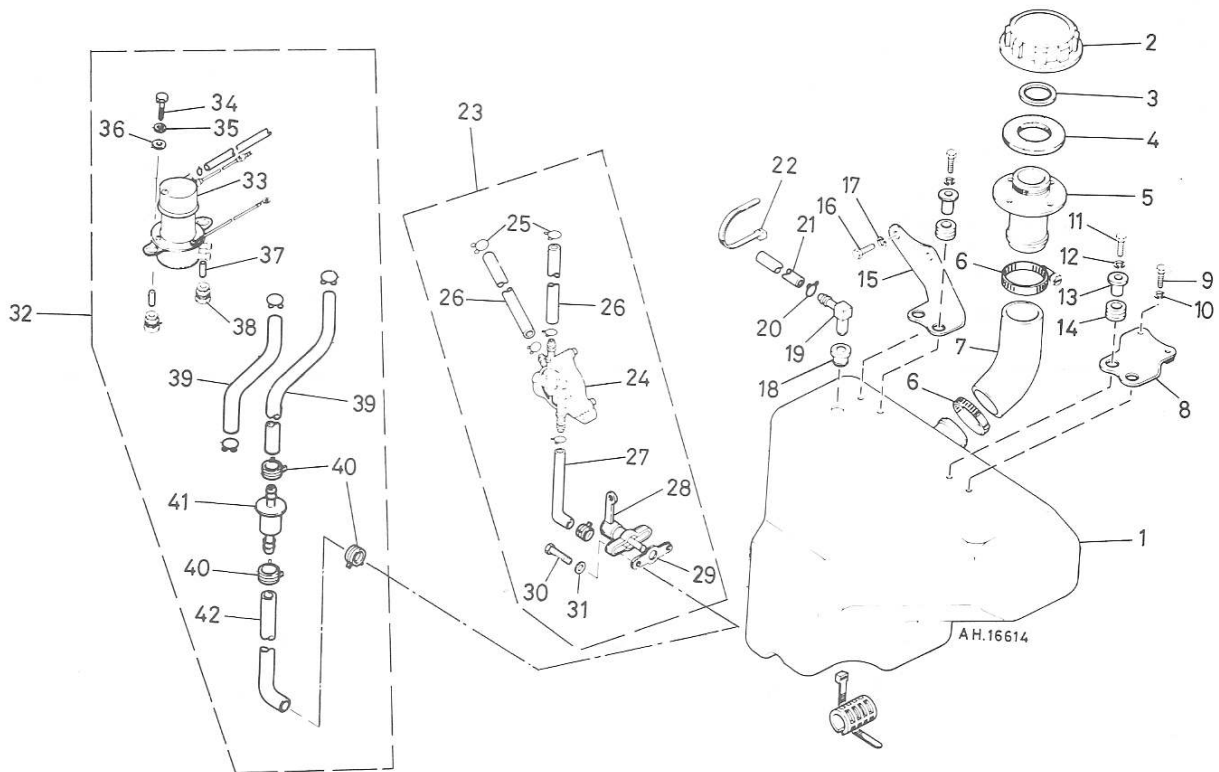


Fig. 3.3 Fuel tank and pump – KLT250 (Sec 2)

- | | | |
|------------------|-------------------------------------|------------------------------|
| 1 Fuel tank | 15 Bracket | 29 Gasket |
| 2 Filler cap | 16 Bolt | 30 Bolt |
| 3 Gasket | 17 Spring washer | 31 Washer |
| 4 Rubber washer | 18 Connector | 32 Fuel pump – electric type |
| 5 Filler tube | 19 Hose union | 33 Fuel pump |
| 6 Clamp | 20 Clip | 34 Bolt |
| 7 Hose | 21 Breather hose | 35 Spring washer |
| 8 Bracket | 22 Tie | 36 Washer |
| 9 Bolt | 23 Fuel pump assembly – vacuum type | 37 Collar |
| 10 Spring washer | 24 Fuel pump | 38 Nut |
| 11 Bolt | 25 Clip | 39 Fuel pipes |
| 12 Spring washer | 26 Fuel pipes | 40 Clip |
| 13 Collar | 27 Fuel pipe | 41 Filter |
| 14 Grommet | 28 Fuel tap | 42 Fuel pipe |

3 Fuel tap – removal, inspection and installation – KLT110, 160 and 250

Caution: Perform fuel system service procedures in a well-ventilated area free from open flames (cigarettes, pilot lights, sparks, etc). Do not smoke and take all suitable precautions to prevent the risk of fire.

- 1 KLT250 models – Drain the fuel tank. See Section 2.
- 2 KLT110 and 160 models – Remove and fuel hose from the tap, place a container of sufficient capacity under the tap, switch on the tap and allow the tank to drain fully.
- 3 Remove its two mounting bolts and withdraw the tap.
- 4 Clean the tap filter gauze with high flash-point solvent and a

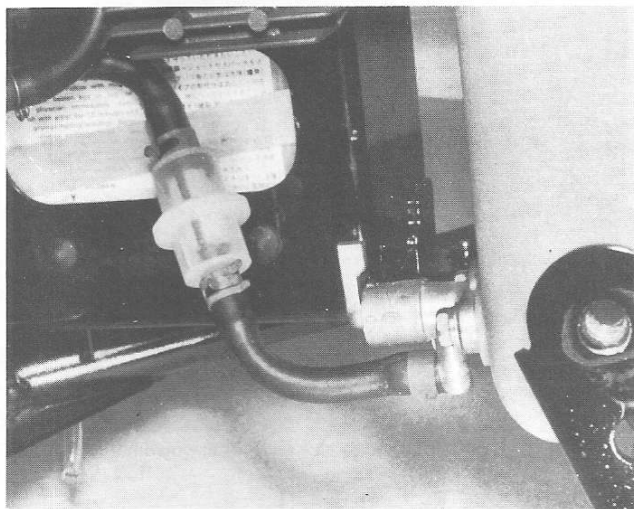
fine-bristled brush. Renew the tap if the gauze is split or torn.

5 KLT250 models – The tap is a sealed unit and must be renewed if it is leaking. If it is blocked, use compressed air to clear it in both 'On' positions; if this fails the tap must be renewed.

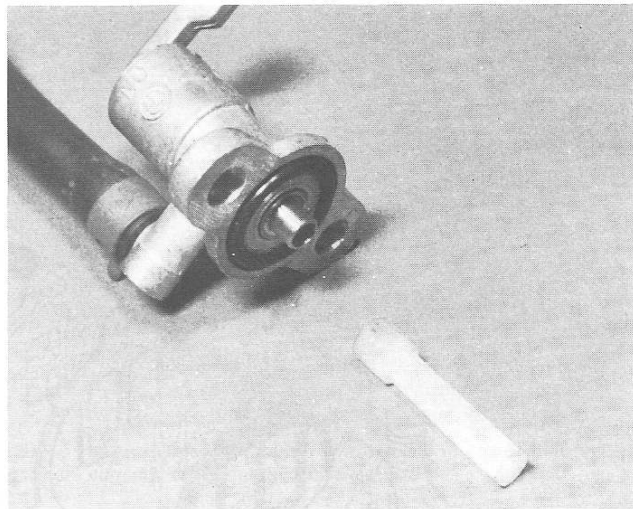
6 KLT110 and 160 models – Remove the two mounting screws and withdraw the plate, the tap lever and the lever gasket. Renew the lever O-ring and gasket if leaks are found. Fit the gasket in the tap body so that it aligns with the fuel passages, having checked that they are unblocked, fit the O-ring to the lever and press the lever into place. Refit the plate and tighten securely the two screws.

7 On refitting always renew the two nylon sealing washers under the mounting bolt heads, also the tap body sealing O-ring (KLT110 and 160) or gasket (KLT250).

8 Installation is the reverse of removal. Fill the tank with gasoline and check for leaks.



3.1 Location of fuel tap and filter – KLT250



3.5 Filter gauze can be cleaned, but tap must be renewed if leaking

4 Fuel and vent hoses – inspection

1 The condition of the fuel system connections, hoses and gaskets should be inspected periodically to reduce the likelihood of a fuel leak developing. If the smell of gasoline is noticed while riding or after the motorcycle has been parked, the system should be checked immediately. **Caution:** *If a fuel odor is detected, be sure to work in a well ventilated area and do not allow open flames (cigarettes, appliance pilot lights, etc.) in the work area.*

2 Inspect the area around the fuel tank, fuel tap and underneath the carburetor for any evidence of leaks or damage. Carefully inspect all fuel lines to make sure they are tightly connected to the fitting and not cracked or otherwise deteriorated. If so, they should be replaced immediately with new ones.

3 Similarly check all vent hoses whether on the fuel system, engine, or final drive. Check that the hoses are correctly routed and secured to prevent them from chafing.

5 Fuel filter – cleaning

Caution: *Perform fuel system service procedures in a well-ventilated area, free from open flames (cigarettes, pilot lights, sparks, etc). Do not smoke and take all suitable precautions to prevent the risk of fire.*

1 Where fitted (see Section 3), the fuel tap filter should be cleaned whenever checks reveal the presence of dirt or water in the system. See Chapter 1.

2 The in-line fuel filter fitted to all KLT200 and 250 models (except KLT250 A1) should be checked and renewed at regular intervals. See Chapter 1.

6 Fuel pump – testing – KLT200 and 250 models

Caution: *Perform fuel system service procedures in a well-ventilated area, free from open flames (cigarettes, pilot lights, sparks, etc). Do not smoke and take all suitable precautions to prevent the risk of fire.*

1 To test the pump output proceed as follows.

2 Wrap a cloth around the hose to prevent fuel spraying out under pressure and pull the hose off the carburetor. Place the hose end in a finely-graduated measuring vessel (made of gasoline-proof material) and operate the pump for exactly one minute. KLT200 A1, A2, A3 and KLT250 A1 models – start the engine and allow it idle for one minute,

then stop it. All other models – switch on the ignition for one minute, then switch off.

3 Note the amount of gasoline in the container. The pump standard output is quoted in Specifications; if the amount actually delivered is less than the service limit, there is a fault.

4 If the pump's output is reduced, check the following items: check the tank (Section 2), the fuel tap (Section 3 – KLT250 only) the fuel filter (Chapter 1) and the hoses (Section 4), looking for blockages, kinked or twisted hoses, etc.

5 If the output remains low remove and check the fuel pump itself. See Section 7.

6 To test the pump's delivery pressure proceed as follows:

7 Wrap a cloth around the hose to prevent fuel spraying out under pressure and pull the hose off the carburetor.

8 Attach a suitable pressure gauge to the fuel hose. Kawasaki's service tool is available under part number T96000-001.

9 KLT200 A1, A2, A3 and KLT250 A1 models – Start the engine and allow it to idle until the pressure stops rising, then stop the engine. All other models – switch on the ignition until the pressure stops rising then switch off.

10 Watch the gauge for one minute.

11 If the pressure does not reach the specified service limit or hold for at least one minute, the fuel pump is at fault. Remove and overhaul it (Section 7).

7 Fuel pump – removal, inspection and installation – KLT200 and 250 models

Caution: *Perform fuel system service procedures in a well-ventilated area, free from open flames (cigarettes, pilot lights, sparks, etc). Do not smoke and take all suitable precautions to prevent the risk of fire.*

KLT200 A1, A2, A3 and 250 A1 models

1 Remove the seat, trunk, rear fender and battery box. See Chapter 5.

2 Disconnect the fuel pipe and drain the tank. See Section 2.

3 Disconnect the carburetor feed pipe, the pulse tube and remove its mounting screws to release the pump. Note carefully which hose connects to which pump union.

4 Remove the three screws and their lock washers. Lift away the pump top cover. Use their protruding tabs to peel off the first diaphragm gasket, the diaphragm itself and second gasket.

5 Very carefully lift off the valve plate. Note that there are two small coil springs in the valve cover which must not be lost or damaged; the pump will not work without them.

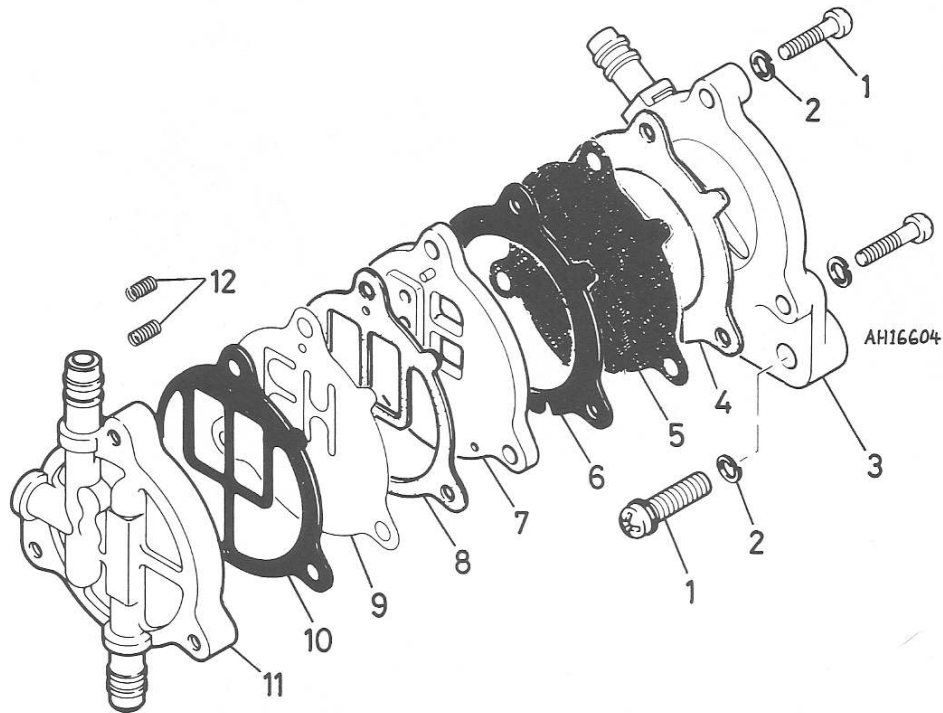


Fig. 3.4 Fuel pump – KLT200 A1, A2, A3 and 250 A1 (Sec 7)

1 Screw	4 Diaphragm gasket	7 Valve plate	10 Black gasket
2 Spring washer	5 Diaphragm	8 Light colored gasket	11 End cover
3 Top cover	6 Diaphragm gasket	9 Clear plastic valve sheet	12 Coil springs

- 6 The valve assembly consists of a light coloured gasket, the clear plastic valve sheet and a black gasket. Peel these off one by one noting how each is fitted and how the coil springs are fitted in the end cover. Note that two of the valve sheet reeds fit through slits in the black gasket.
- 7 Clean all components in high flash-point solvent. Do not use commercial carburetor cleaners or solvents as these may damage the diaphragm or valve sheet. It is recommended that all the gaskets are renewed, even if you were able to remove them intact.
- 8 Check that the diaphragm has no holes or splits and that the valve sheet is not damaged or deteriorated.
- 9 Reassembly is the reverse of the disassembly procedure. Tighten the screws securely.

KLT200 A4 and A4A models

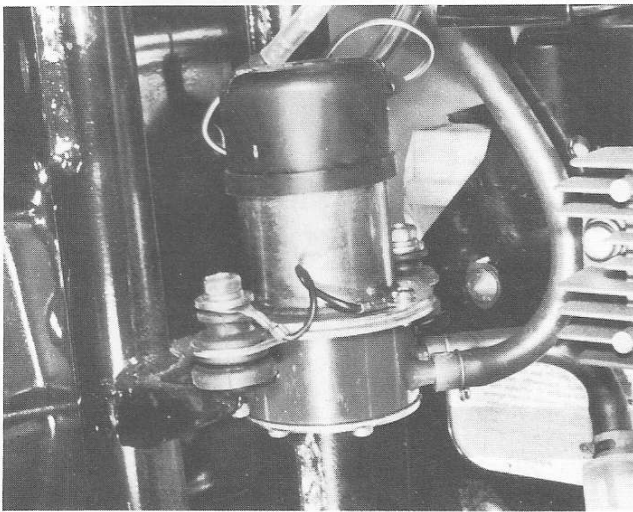
- 10 Clamp the crankcase vent hose shut with self-locking pliers to prevent engine oil running into the air cleaner. Tilt the machine up on to its rear wheels and rear guard.
- 11 Unplug the two fuel pump wiring connectors. Pull the fuel hoses off the pump, noting which hose is fitted to which pump union.
- 12 Remove the two mounting bolts and withdraw the pump. Take care not to lower the vehicle with the pump removed or fuel will spill from the open fuel hose.
- 13 Note: the pump is a sealed assembly for which no replacement parts are available. If the cleaning operation described below fails to cure a pump fault, the pump must be renewed.
- 14 Remove the three screws and withdraw the pump cover, taking care not to lose the white plastic valve inside it. Note the sealing O-ring.
- 15 Remove the piston with its two springs.
- 16 Wash all components in a high flash-point solvent. If any are

damaged the pump must be renewed. Reassembly is the reverse of disassembly, noting the following:

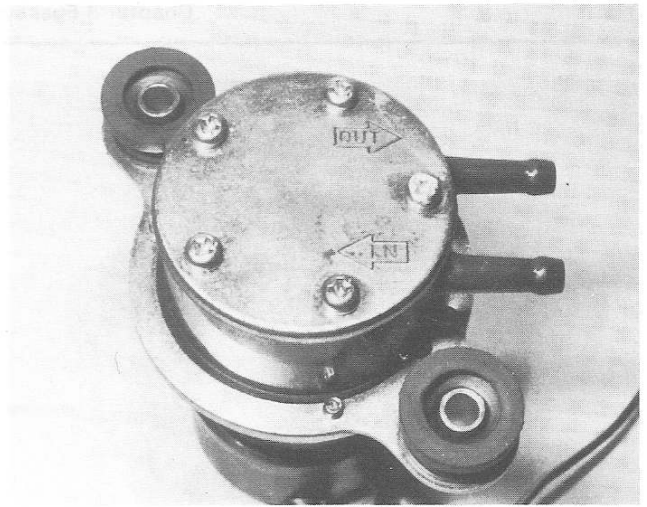
- 17 Fit the long spring to the piston's stepped end, the small spring being fitted into the piston's valve end. Insert the piston, stepped end first, into the pump.
- 18 Check that the valve and O-ring are in place in the cover before refitting it. Do not forget to unclamp the vent hose on lowering the machine.

KLT200 B, C, 250 A2, C and P models

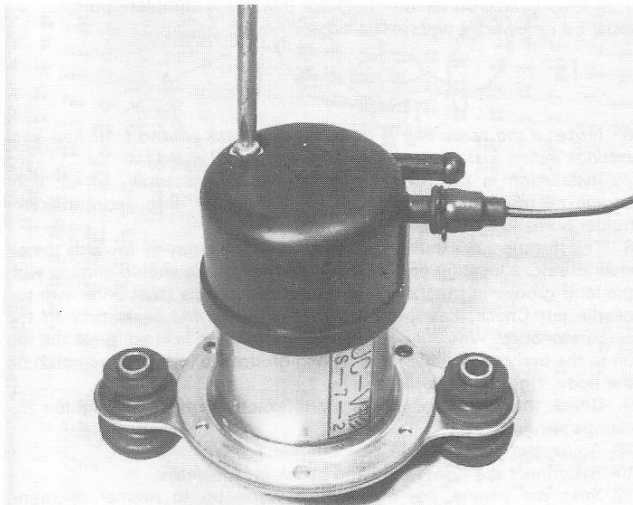
- 19 Clamp the crankcase vent hose shut with self-locking pliers. Tilt the machine up on to its rear wheels and rear guard.
- 20 Unplug the two fuel pump wiring connectors. Pull the fuel hoses and vent hose off the pump, noting carefully which hose is fitted to which pump union.
- 21 Remove the two mounting bolts and withdraw the fuel pump. Take care not to lower the vehicle with the pump removed or fuel will spill from the open fuel hose.
- 22 Note: the pump is a sealed assembly for which no replacement parts are available. If the cleaning operation described below fails to cure a pump fault, the pump must be renewed.
- 23 Remove the five screws securing the pump bottom plate, then remove the plate and its gasket and the pump valve body. Do not attempt further disassembly – the diaphragm is not removable.
- 24 Wash the components in high flash-point solvent. If any are damaged, the pump must be renewed.
- 25 Reassembly is the reverse of disassembly. Do not forget to unclamp the vent hose on lowering the machine.



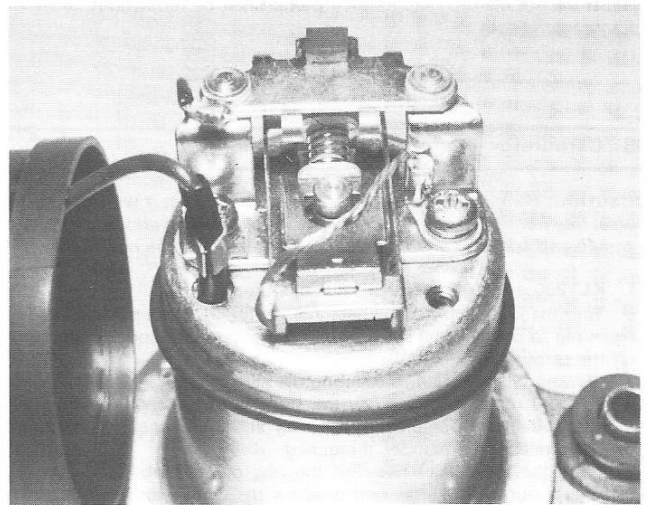
7.20a When removing or refitting fuel pump – KLT200 B, C, KLT 250 A2, C, P ...



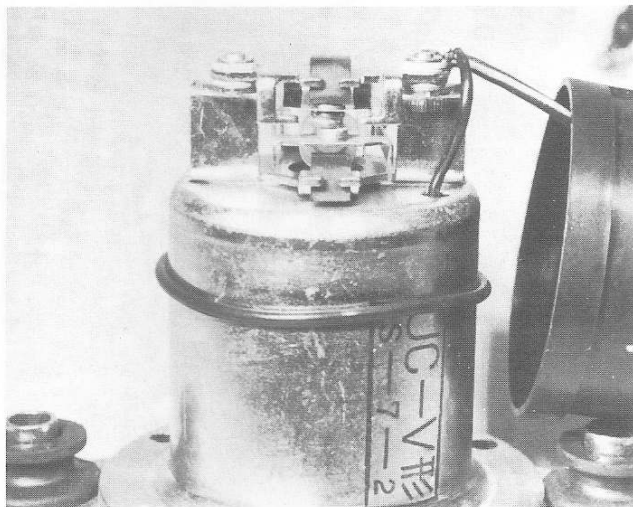
7.20b ... use arrow marks on pump bottom plate to ensure that fuel hoses are correctly connected on installation



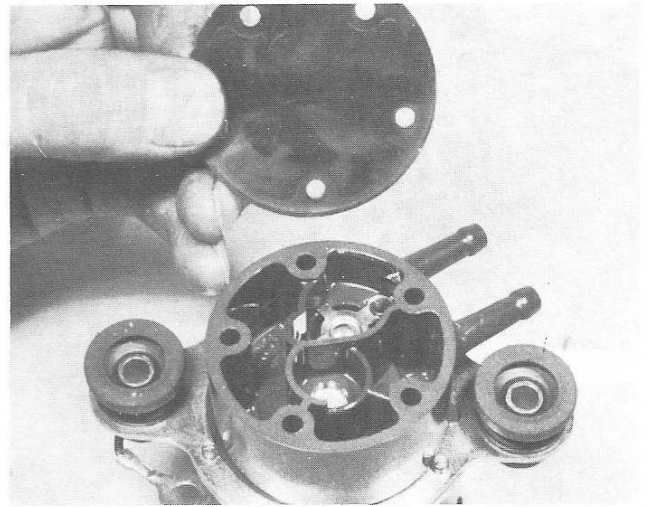
7.22a Although pump is a sealed unit, removal of top cap (single screw) ...



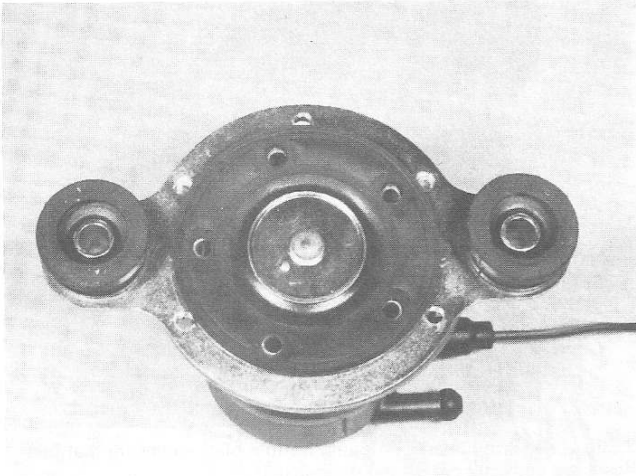
7.22b ... exposes the pump contacts which should not be adjusted ...



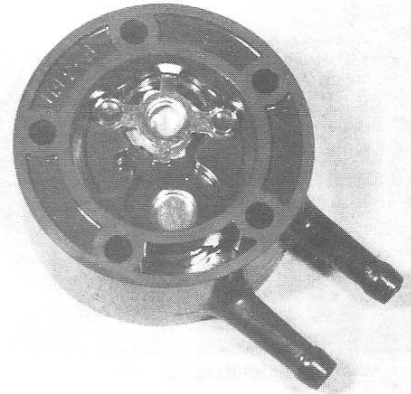
7.22c ... but can be cleaned with fine abrasive paper and freed off if stuck



7.23a Remove bottom plate (five screws) to release pump valve body



7.23b Do not disturb diaphragm – pump must be renewed if diaphragm is split



7.24 Clean valve body and check for damage – complete pump must be renewed if wear or damage is found

8 Carburetor – removal and installation

Caution: Perform fuel system service procedures in a well-ventilated area, free from open flames (cigarettes, pilot lights, sparks, etc.) Do not smoke and take all suitable precautions to prevent the risk of fire.

- 1 **KLT200 and 250 models** – Remove the seat.
- 2 Turn the fuel supply off (where a tap is fitted), wrap the hose end in clean rag to prevent fuel spraying out under pressure and pull the hose off the carburetor.
- 3 Slacken fully the clamps securing the carburetor.
- 4 **KLT160 models** – Unscrew the starter plunger cap, withdraw the plunger assembly. Compress the spring and slide out the cable end nipple to release the plunger, if required.
- 5 Work the air cleaner hose off the rear of the carburetor, pull the carburetor out of its holder and unscrew the carburetor top. Withdraw the throttle valve assembly. Wrap it in clean rag to prevent damage and secure it to the frame top tubes. Remove the carburetor.

6 **Note:** if the carburetor is to be set up, check jet and float/fuel level settings before installing it. Refer to Sections 10 and 11.

7 Installation is the reverse of the removal procedure. Smear light engine oil or similar lubricant on the air cleaner hose and carburetor holder bores to assist installation.

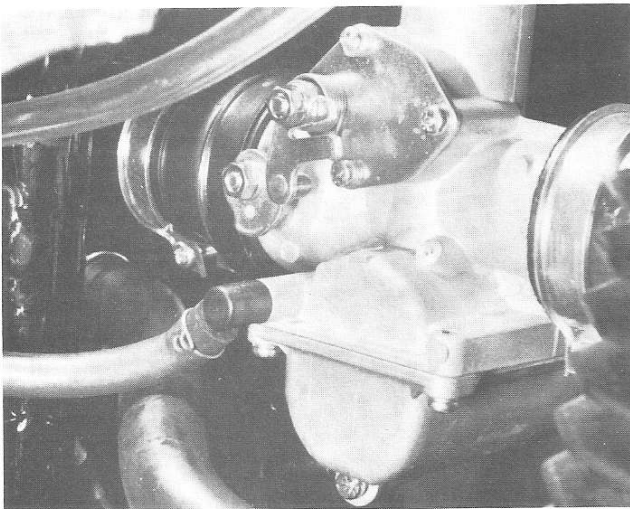
8 The throttle valve must be installed with the cutaway towards the air cleaner side; a locating peg on the carburetor inside should engage with the long groove in the valve and the throttle needle must enter into the needle jet. Check that the valve moves easily and seats fully in the carburetor body. Where a two-piece carburetor top is fitted, press the top on to the body so that the locating peg on the top engages the notch on the body. Tighten the top securely.

9 Check that the carburetor body is exactly vertical and tighten the clamps securely.

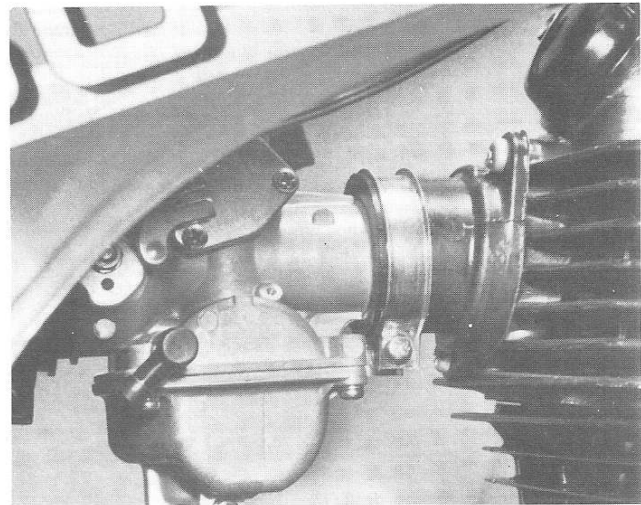
10 Adjust the throttle cable. See Chapter 1.

11 Reconnect the fuel supply and check for fuel leaks.

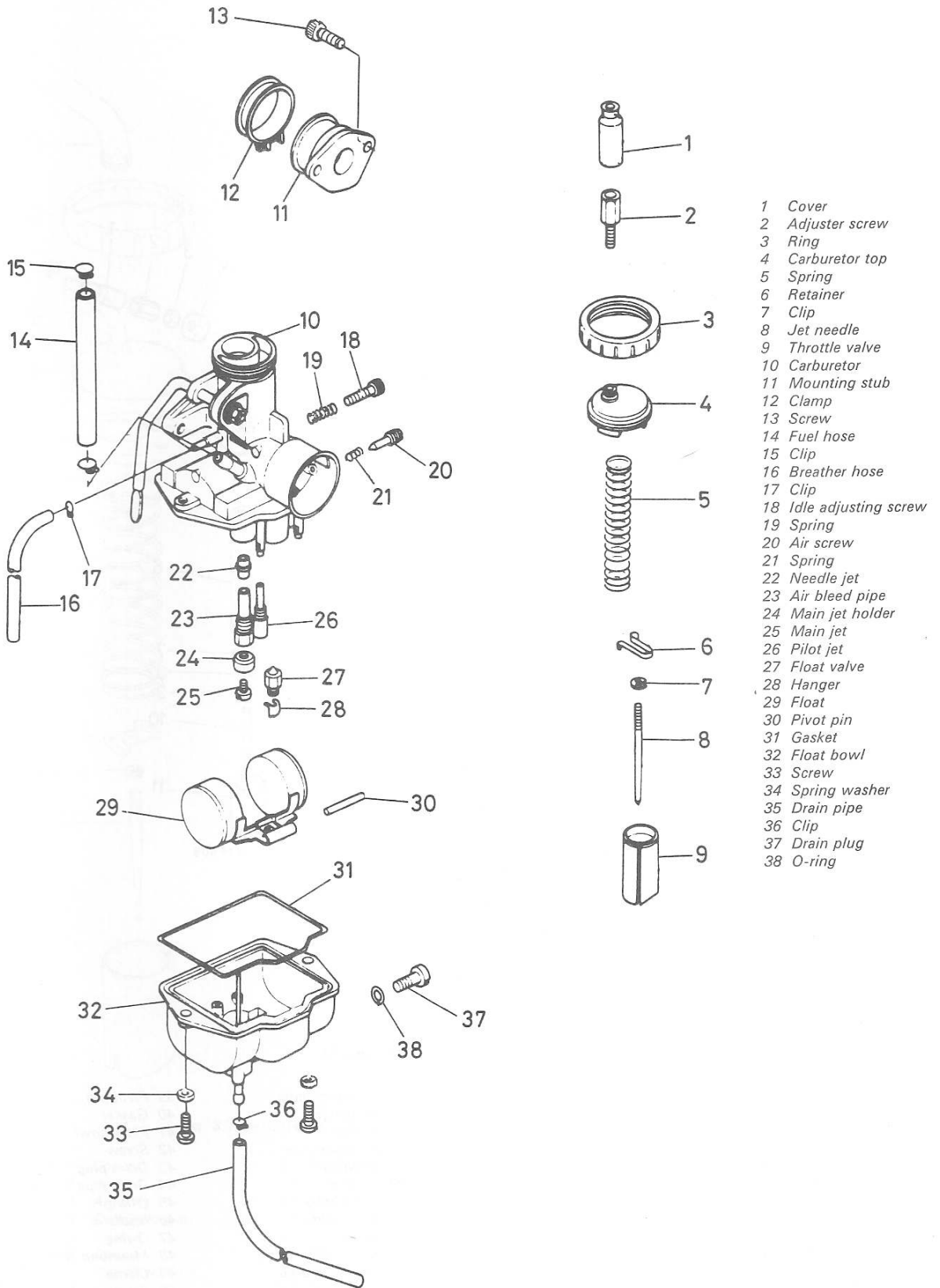
12 Start the engine and allow it to warm up to normal operating temperature, then adjust the carburetor. See Section 11.



8.2 KLT200, 250 – Wrap fuel hose end in clean rag before disconnecting to prevent risk of fuel spraying out under pressure



8.3 Slacken fully both carburetor securing clamps



- 1 Cover
- 2 Adjuster screw
- 3 Ring
- 4 Carburetor top
- 5 Spring
- 6 Retainer
- 7 Clip
- 8 Jet needle
- 9 Throttle valve
- 10 Carburetor
- 11 Mounting stub
- 12 Clamp
- 13 Screw
- 14 Fuel hose
- 15 Clip
- 16 Breather hose
- 17 Clip
- 18 Idle adjusting screw
- 19 Spring
- 20 Air screw
- 21 Spring
- 22 Needle jet
- 23 Air bleed pipe
- 24 Main jet holder
- 25 Main jet
- 26 Pilot jet
- 27 Float valve
- 28 Hanger
- 29 Float
- 30 Pivot pin
- 31 Gasket
- 32 Float bowl
- 33 Screw
- 34 Spring washer
- 35 Drain pipe
- 36 Clip
- 37 Drain plug
- 38 O-ring

Fig. 3.5 Carburetor - KLT110 (Sec 8)

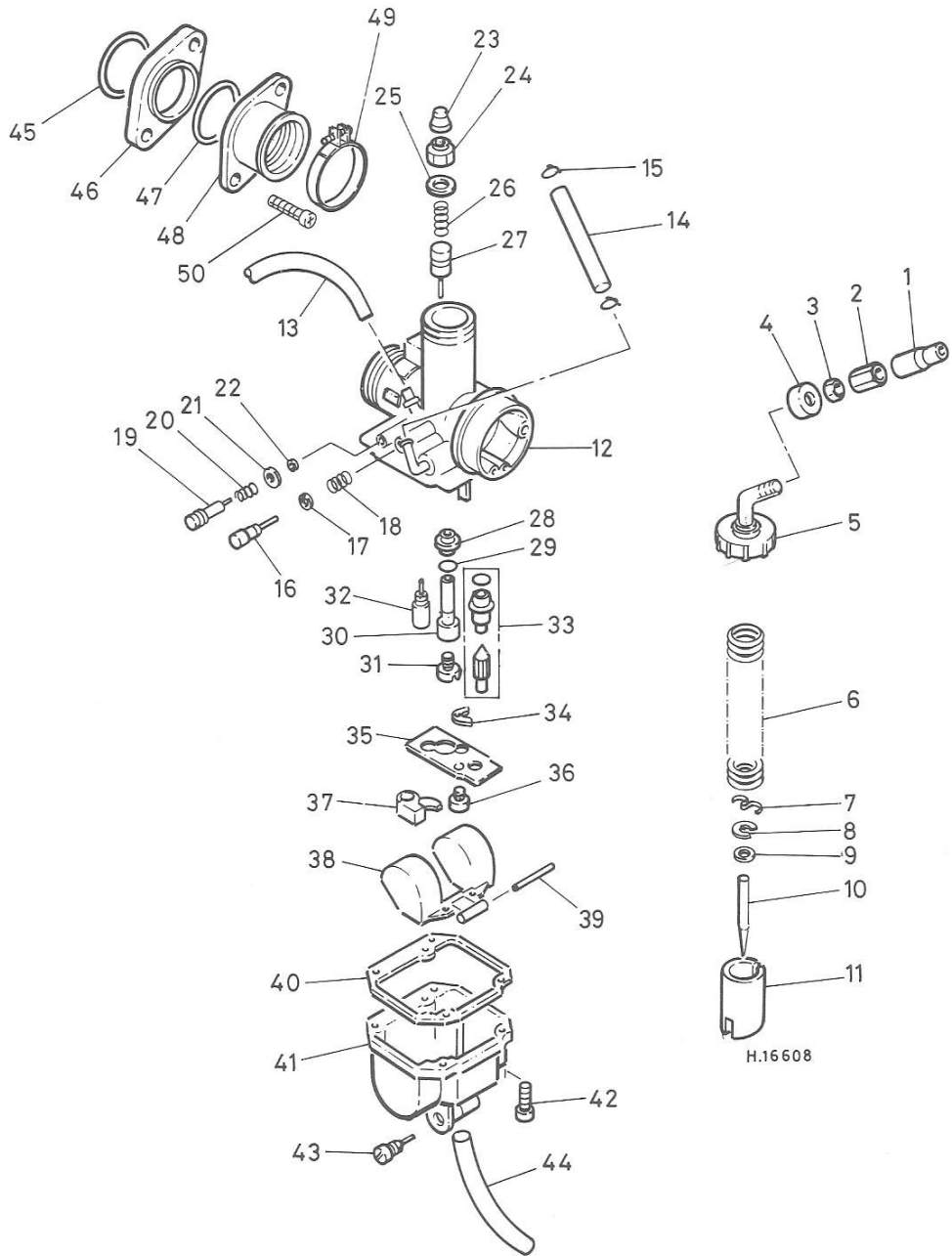


Fig. 3.6 Carburetor – KLT160 (Sec 8)

- | | | | |
|-------------------|-------------------------|--------------------|------------------|
| 1 Cover | 14 Fuel hose | 27 Starter plunger | 39 Pivot pin |
| 2 Adjuster | 15 Clip | 28 Needle jet | 40 Gasket |
| 3 Locknut | 16 Idle adjusting screw | 29 O-ring | 41 Float bowl |
| 4 Cap | 17 O-ring | 30 Air bleed pipe | 42 Screw |
| 5 Carburetor top | 18 Spring | 31 Main jet | 43 Drain plug |
| 6 Spring | 19 Air screw | 32 Pilot jet | 44 Drain pipe |
| 7 Retainer | 20 Spring | 33 Float valve | 45 O-ring |
| 8 Clip | 21 Washer | 34 Seat holder | 46 Insulator |
| 9 Washer | 22 O-ring | 35 Plate | 47 O-ring |
| 10 Jet needle | 23 Cover | 36 Screw | 48 Mounting stub |
| 11 Throttle valve | 24 Cap | 37 Main jet baffle | 49 Clamp |
| 12 Carburetor | 25 O-ring | 38 Float | 50 Screw |
| 13 Breather hose | 26 Spring | | |

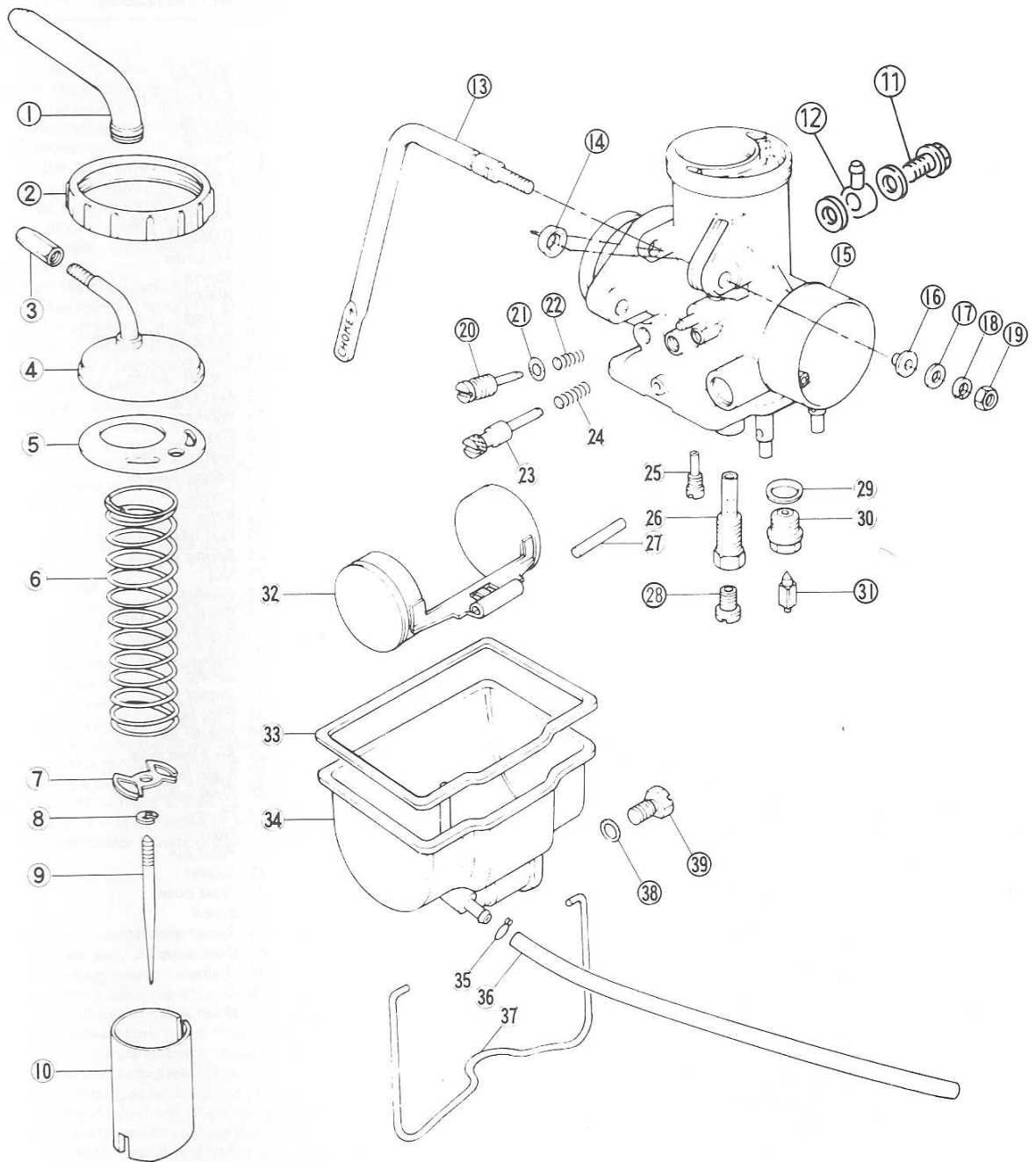
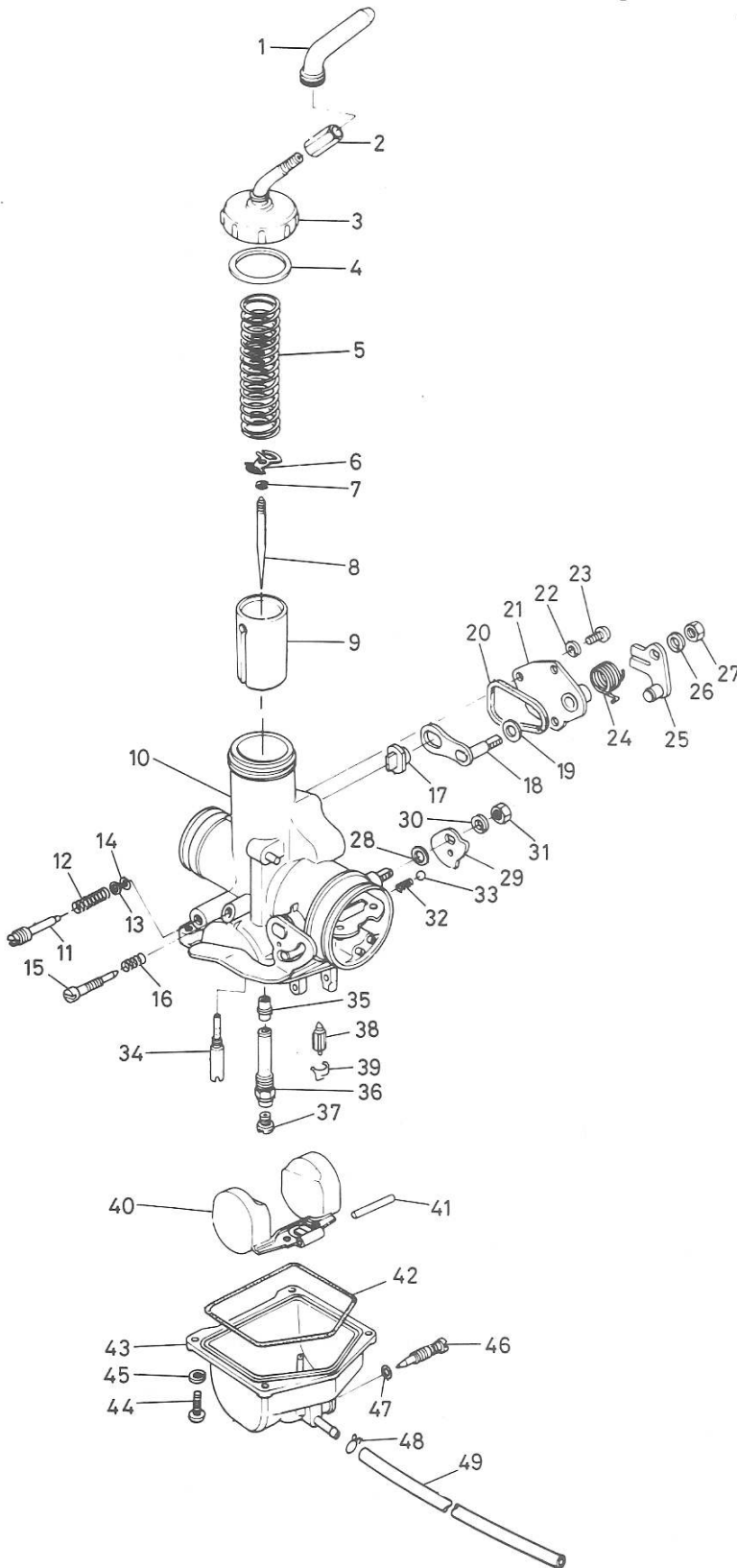


Fig. 3.7 Carburetor – KLT200 A1, A2 and A3 – up to frame no. 522924 (Sec 8)

- | | | | |
|-------------------|-----------------------|-------------------------|------------------------|
| 1 Cover | 11 Banjo bolt | 21 O-ring | 31 Float valve |
| 2 Ring | 12 Fuel banjo fitting | 22 Spring | 32 Float |
| 3 Adjuster | 13 Starter lever | 23 Idle adjusting screw | 33 Gasket |
| 4 Carburetor top | 14 Seal | 24 Spring | 34 Float bowl |
| 5 Gasket | 15 Carburetor | 25 Pilot jet | 35 Clip |
| 6 Spring | 16 Dust seal | 26 Air bleed pipe | 36 Drain pipe |
| 7 Needle retainer | 17 Washer | 27 Pivot pin | 37 Float bowl retainer |
| 8 Clip | 18 Spring washer | 28 Main jet | 38 O-ring |
| 9 Jet needle | 19 Nut | 29 Gasket | 39 Drain plug |
| 10 Throttle valve | 20 Air screw | 30 Float valve seat | |

Fig. 3.8 Carburetor – KLT200 A3 – frame no. 522925 on, A4, A4A, B, C and KLT250 (Sec 8)



- 1 Cover
- 2 Adjuster
- 3 Carburetor top
- 4 Gasket
- 5 Spring
- 6 Retainer
- 7 Clip
- 8 Jet needle
- 9 Throttle valve
- 10 Carburetor
- 11 Air screw
- 12 Spring
- 13 Washer
- 14 O-ring
- 15 Idle adjusting screw
- 16 Spring
- 17 Throttle guide
- 18 Fast idle shaft
- 19 Washer
- 20 Gasket
- 21 Fast idle cover
- 22 Spring washer
- 23 Screw
- 24 Return spring
- 25 Fast idle arm plate
- 26 Spring washer
- 27 Nut
- 28 Washer
- 29 Starter cam plate
- 30 Spring washer
- 31 Nut
- 32 Spring
- 33 Detent ball
- 34 Pilot jet
- 35 Needle jet
- 36 Air bleed pipe
- 37 Main jet
- 38 Float valve
- 39 Hanger
- 40 Float
- 41 Pivot pin
- 42 Gasket
- 43 Float bowl
- 44 Screw
- 45 Spring washer
- 46 Drain plug
- 47 O-ring
- 48 Clip
- 49 Drain pipe

9 Carburetor – disassembly, inspection and reassembly

Disassembly

- 1 Remove the carburetor. See Section 8.
- 2 Compress the throttle valve against the carburetor top, slip the inner cable out of the valve and up through the slot in the valve. Remove the needle retainer and withdraw the needle with its clip. Do not disturb the clip unless necessary.
- 3 Remove the pilot air/mixture screw and throttle stop screw. Screw each in until it seats lightly, counting and recording the exact number of turns required to do so. On installation reverse the procedure to return both screws to their original setting.
- 4 KLT110 models – Unscrew the main air jet from the air cleaner end of the carburetor bore.
- 5 Lever back the clip (early KLT200 A models) or remove the retaining screws (all other models) to release the float bowl. Tap it lightly to break the joint and withdraw it, noting the O-ring or gasket. The drain plug need not be removed unless necessary.
- 6 KLT160 models – Remove the main jet baffle.
- 7 Remove the float pivot pin, then withdraw the float and valve needle.
- 8 KLT160 models – Remove the retaining screw and withdraw the plate, the valve seat holder and the valve seat, noting its O-ring. Early KLT200 A models – Unscrew the valve seat, noting its gasket.
- 8 Unscrew the main jet, air bleed pipe and the pilot jet. Note the O-ring around the air bleed pipe (KLT160).
- 9 Except early KLT200 A models – Using a wooden dowel or a finger (do not use any metal tool) inserted through the throttle valve bore, press out from above the needle jet.
- 10 Later KLT200 A and all KLT200 B, C and 250 models – Dismantle the fast idle linkage as follows:
 - 11 Remove the three screws and lock washers, then withdraw the fast idle cover and the plastic valve guide. Note the cover gasket.
 - 12 Remove the nut and lock washers to separate the fast idle link and spring from the cover, then withdraw the link lever and remove the plastic washer from the shaft.
 - 13 Applying firm pressure to retain the cam against the carburetor body, remove its retaining nut and lock washer. Slowly remove the cam and its plastic washer, catching the detent ball and spring as they are released.
- 14 Early KLT200 A models – Remove the banjo bolt to release the fuel banjo fitting. Note the sealing washer on each side of the banjo.
- 15 Except KLT160 – There is little point in attempting to dismantle the choke assembly. If it is damaged or worn there are no individual parts available; the carburetor assembly must be renewed.

Inspection

- 16 Submerge the components in carburetor cleaner and allow them to soak for approximately 30 minutes. Do not place any plastic or rubber parts in the cleaning solution as they will be damaged or dissolved. Also, do not let excessive amounts of carburetor cleaner get on your skin.
- 17 After the carburetor has soaked long enough for the cleaner to loosen and dissolve varnish and other deposits, rinse it thoroughly in solvent and blow it dry with compressed air. Blow out all the air passages in the float bowl and carburetor body with compressed air. **Note:** *Never clean the jets or passages with a piece of wire or a drill bit as they will be enlarged, causing the fuel and air metering rates to be changed.* A broom straw or nylon bristle works well for this sort of cleaning.
- 18 Inspect the throttle valve and its bore for evidence of excessive wear, nicks and scratches. Make sure the valve moves freely up and down in the bore. If wear is excessive, a new carburetor is the only solution. If the valve binds in the bore, it may be loosened up by sanding it lightly with a very fine piece of emery cloth or 600 grit wet/dry sandpaper.
- 19 Inspect the jet needle, the needle jet and the carburetor body for wear and make sure the needle is not bent or nicked. If the machine has a lot of miles on it, the needle and jet may be worn enough to require replacement with new parts.
- 20 Check the float valve and the seat for nicks and a pronounced groove or ridge on the sealing surface of the needle. If there is evidence of wear, the needle can be replaced with a new one. Where the seat is not removable, if it is excessively worn the carburetor body must be replaced with a new one.
- 21 Check the float pivot and its bore for wear. If the pin is a sloppy fit in the bores, excessive amounts of fuel will be allowed to enter the carburetor and flooding will occur.

22 Check the air screw for nicks and evidence of wear. Replace it with a new one if it is damaged.

23 Check the float for dents or other deformation. Shake it to see if any fuel has leaked in. If so renew the float.

24 Check all other components for wear or damage, renewing items where necessary.

Reassembly

25 The carburetor must be reassembled on a clean work surface, with care being taken that all components are absolutely clean. Discard all gaskets and O-rings; these should always be renewed to prevent fuel leaks.

26 When installing components use only a close-fitting spanner or screwdriver as appropriate. Do not overtighten the jets or any retaining screws; the threads in the carburetor body are easily damaged, as are the soft brass jets.

27 Reassembly is the reverse of the dismantling procedure. Refer to the relevant illustration if in doubt as to the position of any component. Note the following points:

28 Later KLT200 A and all KLT200 B, C and 250 models – Fit first the spring, then the detent ball into the carburetor body before refitting the plastic washer and fast idle cam to the choke shaft. Hold the cam in place while the retaining nut (and lock washers) is refitted and tightened. Check that the choke moves smoothly throughout its full travel, and that the detent works properly.

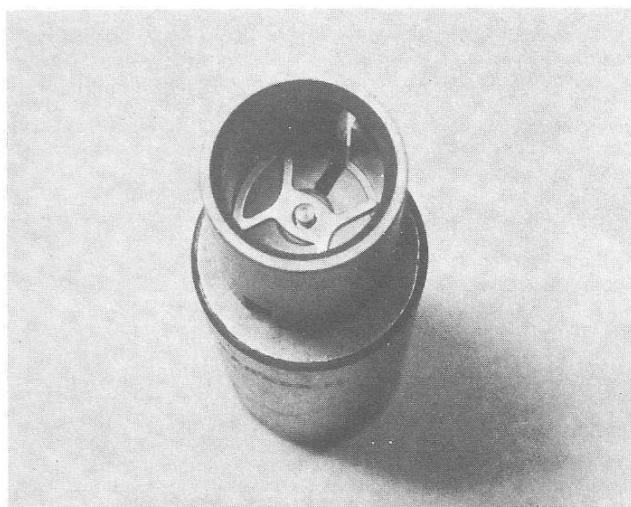
29 When reassembling the fast idle link components, the spring longer end hooks over the cover, its shorter end hooking over the link. Check that the link and link lever rotate smoothly against spring pressure.

30 Install the plastic guide and fit the cover so that the link lever engages the guide. Rotate the cover against spring pressure, being careful not to disturb the gasket, until the screw holes align then refit and tighten the retaining screws.

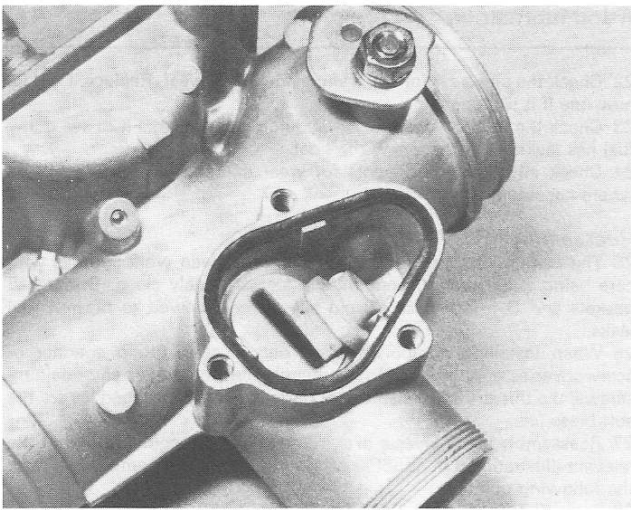
31 Twist the link several times to ensure that it operates easily and moves the plastic guide fully up and down. The lever **must** be spring-loaded to turn clockwise as far as possible or the engine may not return completely to idle when the throttle lever is released.

32 Except early KLT200 A models – Invert the carburetor body and drop the needle jet into place with its smaller diameter (KLT110, 200, 250) or longer (KLT160) end entering first. Check that the jet is in place and slowly screw in the air bleed pipe to press it fully into position. **Do not** apply excessive force; if the needle jet enters its bore at an awkward angle and the air bleed pipe is overtightened the jet, bleed pipe or carburetor body may be damaged and require renewal.

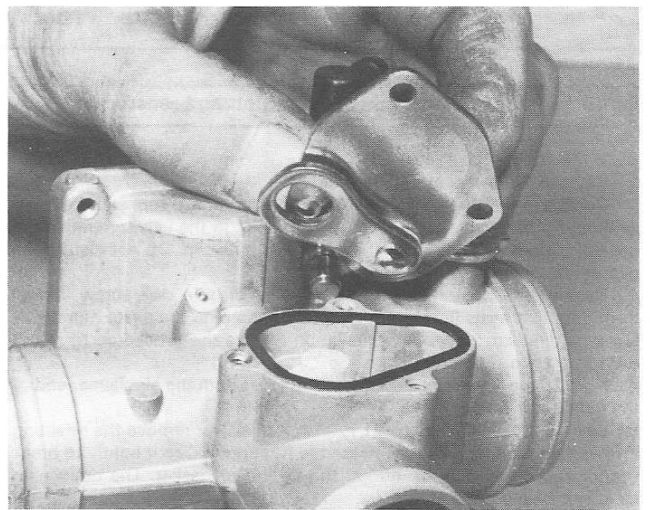
33 Position the float needle on the float (where a wire clip is fitted), place the float in position and refit the pivot pin. Check the float for proper operation and check its height (Section 11).



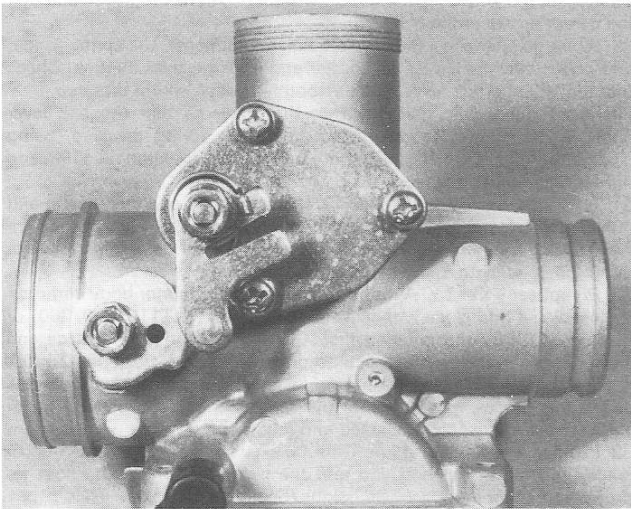
9.2 Throttle needle and clip are secured by retainer as shown



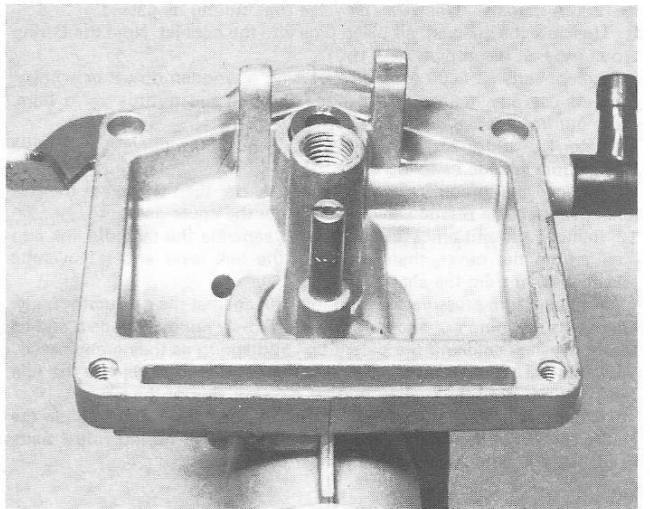
9.28 Install (where applicable) fast idle cam and check operation before fitting throttle valve plastic guide



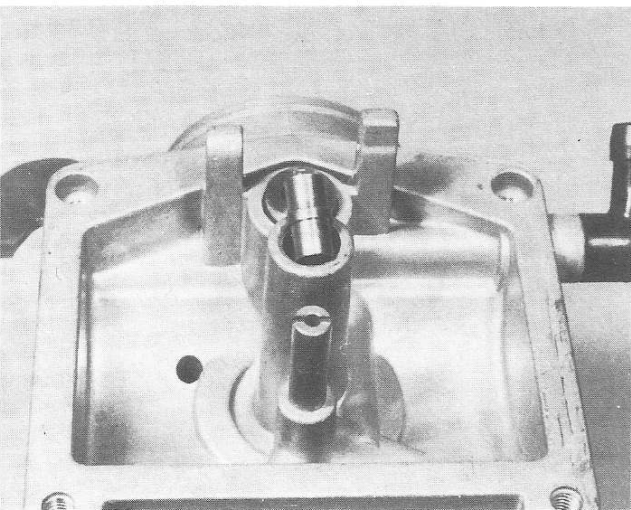
9.29 Check fast idle link and lever operation before refitting



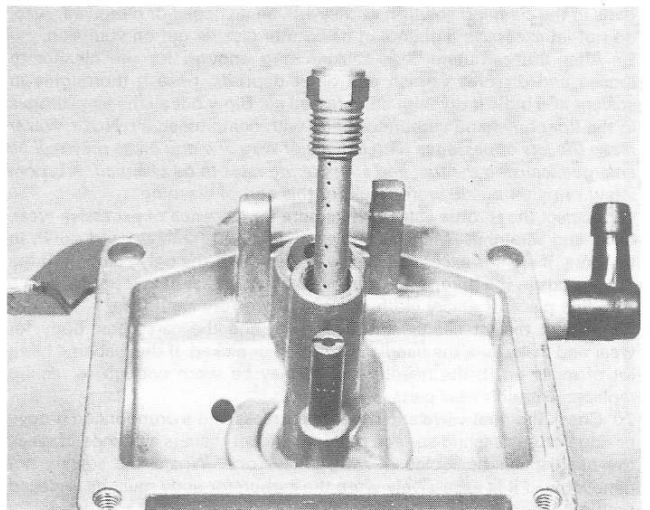
9.31 Check that fast idle mechanism operates correctly before installing carburetor



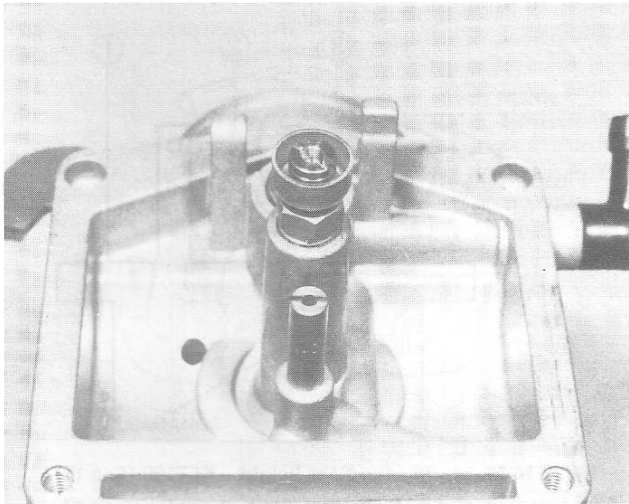
9.32a Screw pilot jet into place – do not overtighten



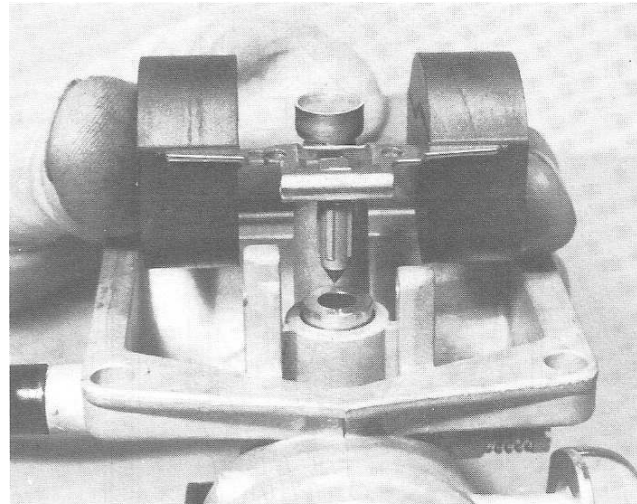
9.32b Be careful to check that needle jet is correctly seated ...



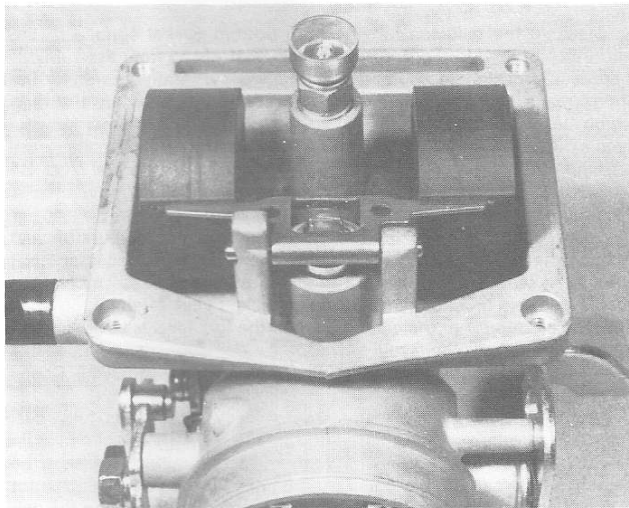
9.32c ... before tightening air bleed pipe



9.32d Do not omit main jet baffle (where fitted)



9.33a Position float needle on pivot tang as shown ...



9.33b ... and refit float pivot pin to retain assembly

10 Carburetor – checking the settings

1 The various jet sizes, throttle valve cutaway and needle position are predetermined by the manufacturer and should not require modification. Check with the Specifications list at the beginning of this Chapter if there is any doubt about the types fitted. If a change appears necessary it can often be attributed to a developing engine fault unconnected with the carburetor. Although carburetors do wear in service, this process occurs slowly over an extended length of time and hence wear of the carburetor is unlikely to cause sudden or extreme malfunction. If a fault does occur check first other main systems, in which a fault may give similar symptoms, before proceeding with carburetor examination or modification.

2 Where non-standard items, such as exhaust systems, air cleaners or camshafts have been fitted to a machine, some alterations to carburation may be required. Arriving at the correct settings often requires trial and error, a method which demands skill borne of previous experience. In many cases the manufacturer of the non-standard equipment will be able to advise on correct carburation changes.

3 As a rough guide, up to $\frac{1}{8}$ throttle is controlled by the pilot jet, $\frac{1}{8}$ to $\frac{1}{4}$ by the throttle valve cutaway, $\frac{1}{4}$ to $\frac{3}{4}$ throttle by the needle position and from $\frac{3}{4}$ to full by the size of the main jet. These are only approximate divisions, which are by no means clear cut. There is a certain amount of overlap between the various stages.

4 If alterations to the carburation must be made, always err on the side of a slight rich mixture. A weak mixture will cause the engine to overheat which may cause engine seizure. Reference to Chapter 1 will show how, after some experience has been gained, the condition of the spark plug electrodes can be interpreted as a reliable guide to mixture strength.

11 Carburetor – adjustment

Caution: Perform fuel system service procedures in a well ventilated area, free from open flames (cigarettes, pilot lights, sparks, etc). Do not smoke and take all suitable precautions to prevent the risk of fire.

1 The first step in carburetor adjustment is to check, and adjust if necessary the fuel level.

2 KLT110 and early KLT200 A models – The service tool required is Part Number 57001-208, which is screwed into the float bowl drain plug orifice. An alternative to this is to attach a length of clear plastic tubing to the carburetor overflow/drain hose and to use an accurate ruler for measurement.

3 KLT160, late KLT200 A and all KLT200 B, C and 250 models – The correct Kawasaki service tool, Part Number 57001-1017 is a clear plastic tube graduated in millimetres; an alternative is to use a length of clear plastic tubing and an accurate ruler. Connect one end of the tube to the float chamber drain outlet (use the drain tube if the Kawasaki tool is being used).

4 All models – Place the tube upper end against the carburetor body as shown in the accompanying illustration. Mark the tube at a point several millimetres above the bottom edge of the carburetor body (use the 'O' mark on the service tool), then unscrew the float chamber drain plug by one or two full turns (where applicable) and switch on the fuel supply (KLT110, 160). On KLT200 and 250 models start the engine and allow it to idle for a few minutes, then stop it.

5 Wait for the fuel level to stabilise then very slowly bring the tube down the carburetor body until the mark is level with its bottom edge and at the center of the carburetor. Do not lower the tube beyond this and raise it again or the level will be inaccurate. Measure the distance between the bottom edge of the carburetor body and the top of the fuel in the gauge.

6 The fuel level should be noted. If the level is outside the tolerances (where given) or not as listed in the Specifications Section of this

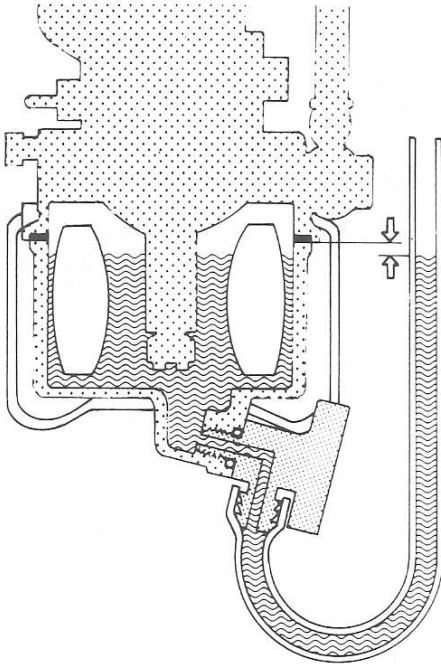


Fig. 3.9 Checking fuel level – typical (Sec 11)

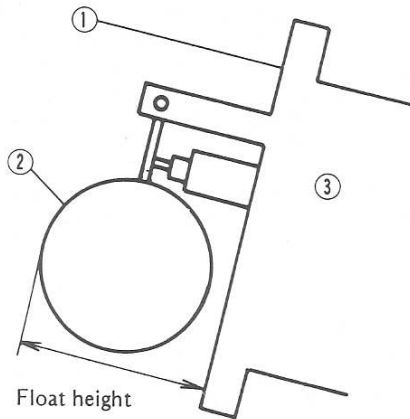


Fig. 3.11 Measuring the float height – KLT110, 200 and 250 (Sec 11)

- 1 Float bowl mating surface 3 Carburetor body
2 Float

Chapter the carburetor must be removed from the machine and the setting altered as follows.

7 Remove the float bowl.

8 Refer to the appropriate illustration, if necessary. KLT160 model – Invert the carburetor and measure the float height with the needle tip compressed. KLT110 – Hold the carburetor vertical with the air cleaner side upwards, then slowly invert it until the weight of the float is compressing the needle tip. KLT200 and 250 models – Hold the carburetor vertical with the air cleaner side upwards, then slowly invert it until the float is just resting on the needle and **not** compressing its tip.

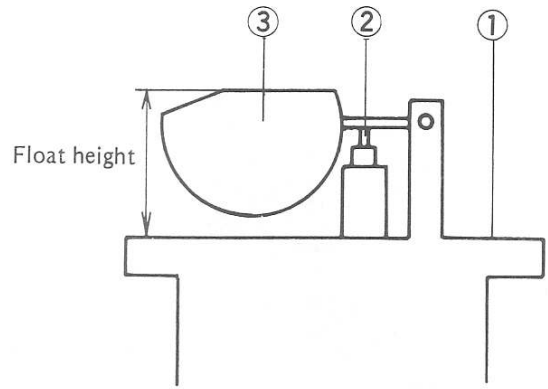


Fig. 3.10 Measuring the float height – KLT160 (Sec 11)

- 1 Float bowl mating surface 3 Float
2 Float valve needle rod

9 Measure the distance between the bottom gasket surface of the carburetor body and the bottom of each float of the float assembly. If there is any discrepancy it can be corrected by bending carefully the bridge piece, then remove the float and bend as necessary the tang which bears on the float needle. Bending the tang up (towards the needle) increases the float height and lowers the fuel level, therefore bending it down decreases the float height and raises the fuel level. Be very careful when bending the tang; only the smallest movement is necessary to effect a major change in float height.

10 When adjustment is complete, reassemble the carburetor and recheck the fuel level. Make the adjustments again, if necessary, but note that if serious difficulties are encountered, the float assembly, float needle and seat must be removed and checked very carefully for wear. Refit the carburetor to the machine when the fuel level is at the correct setting, or at least within tolerances.

11 KLT200 A (later models only) B, C and KLT250 models – Check the fast idle link-to-cam clearance as follows:

12 Check that the throttle valve moves easily through its full travel when the throttle lever is pressed and released. Press the choke lever fully down, then lightly press forwards the fast idle link. Measure the clearance between the pin collar on the link and the cam; if this is not as specified it can be adjusted by carefully spreading or closing the gap in the link.

13 All models – Screw in the pilot air/mixture screw until it seats lightly, then unscrew it by the number of turns specified (see Specifications).

14 Start the engine and allow it to warm up to normal operating temperature.

15 With the engine ticking over, try turning the pilot screw in by 1/4 turn at a time, noting its effect on the idling speed, then repeat the process, this time turning the screw outwards. Leave the screw in the position which gives the fastest consistent idle speed, with the engine running smoothly and easily. Use the throttle stop screw to adjust the idling speed to the slowest speed at which the engine will tick over smoothly and reliably. Note that the pilot air/mixture screw final setting should be very close to that specified.

16 Take the machine on a short journey to warm it up fully and settle all components, then re-check the pilot and throttle stop screw settings. Check that the engine does not falter and stop when the throttle lever is released, and the idle speed does not vary as the handlebars are turned.

17 **Note:** It must be remembered that if a fault arises which appears to indicate a carburetor malfunction, **all other** components must be checked **before** the carburetor is disturbed. Check that the air cleaner element is clean and that there are no leaks in the cleaner assembly or carburetor mountings, that the valve clearances are correct, that all ignition system components are in good condition and correctly adjusted and that there are no leaks or damage in the exhaust system.

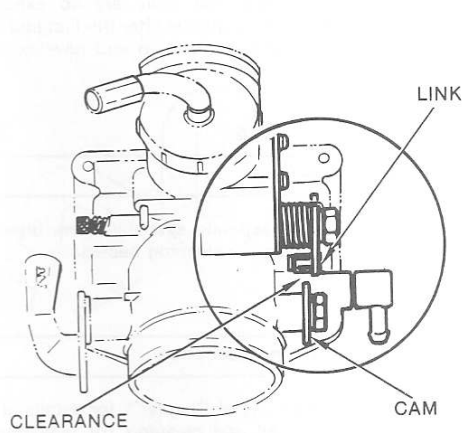
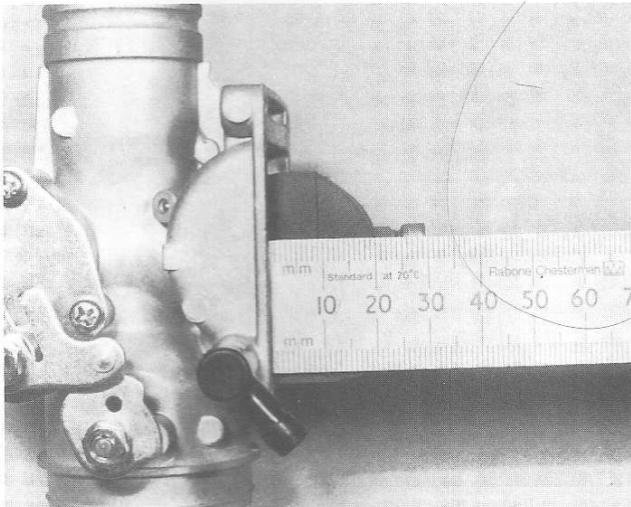
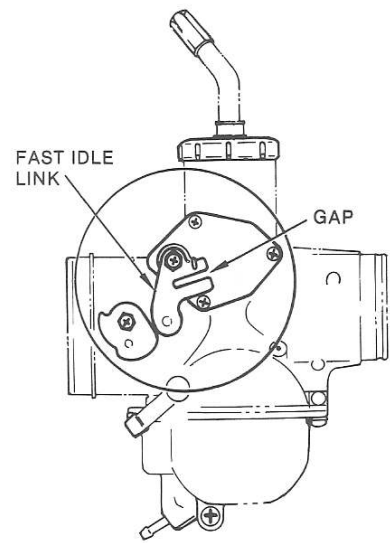
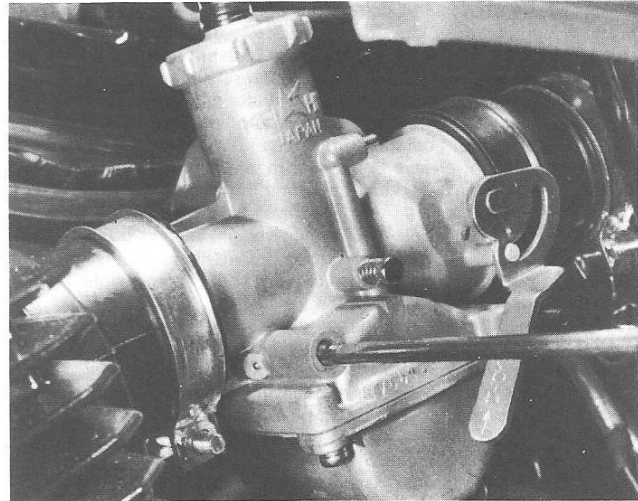


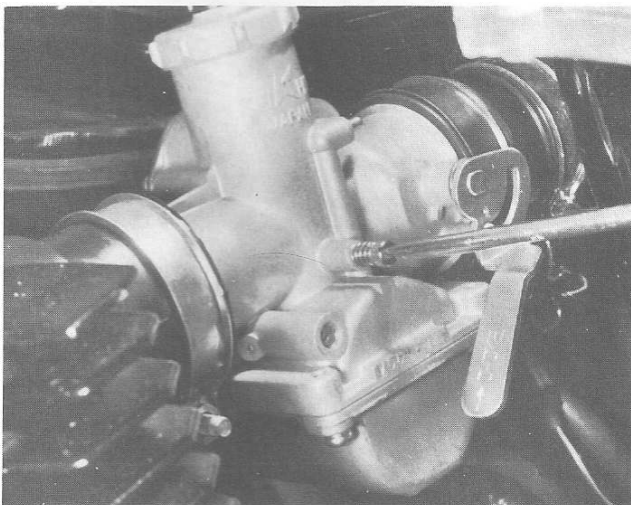
Fig. 3.12 Checking fast idle link-to-cam clearance (Sec 11)



11.8 Measuring the float height



11.13 Unscrew pilot screw by number of turns specified to provide initial setting



11.15 Use throttle stop screw to set idle speed

12 Air cleaner – cleaning the element

- 1 Refer to Chapter 1 for information on regular cleaning and re-oiling the filter element.
- 2 Note that the element must be renewed after every five cleanings to preserve engine performance.

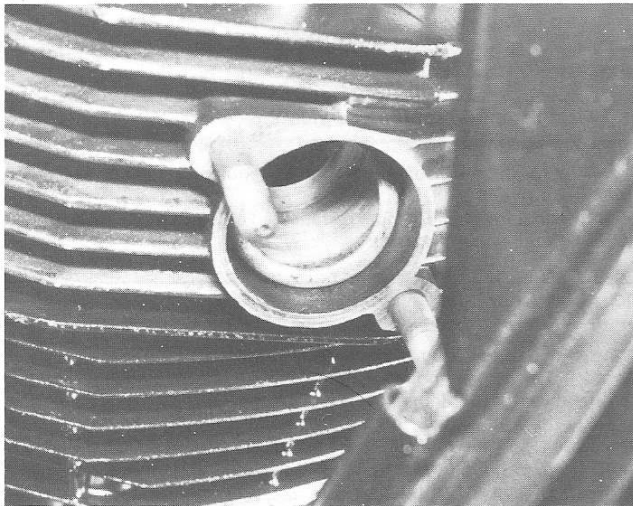
13 Air cleaner – removal and installation

- 1 Remove the air filter element. See Chapter 1.
- 2 KLT110 and 160 models – Remove the rear fender. See Chapter 5.
- 3 Remove the mounting bolts as follows. KLT110 models – Two bolts at the front, inside the casing, one at the right side top, outside the casing. KLT160 models – Two bolts, one on either side. KLT200 A models – One bolt at the rear. KLT200 B, C and 250 models – One bolt at the right side top of the casing.
- 4 Slacken the clamp securing the air cleaner hose to the carburetor.
- 5 KLT200 and 250 models – Disconnect the crankcase vent tube at the crankcase.

- 6 Remove the casing from the frame.
- 7 On installation, check that the carburetor duct, drain fitting and vent tube or breather cap (as applicable) are refitted. On KLT200 and 250 models ensure that the locating peg on the casing underside locates correctly in the rubber grommet on the battery box.
- 8 Refit all hoses and ducts, ensuring that they are correctly routed, before refitting the mounting bolts.

14 Exhaust system – removal, inspection and installation

- 1 If the extra working space is necessary, remove the seat and rear fender. See Chapter 5. KLT200 A models – Additionally, it may be necessary to remove the carburetor. See Section 8.
- 2 Slacken fully the muffler clamp bolt. Remove the two muffler mounting bolts. Pull the muffler backwards off the exhaust pipe.
- 3 KLT160 models – Remove the exhaust pipe rear mounting bolt. Do not lose the mounting collar.
- 4 Remove the two front mounting nuts and slide back the exhaust pipe holder from the cylinder head studs.
- 5 Except KLT110 models – Remove the two split keepers.
- 6 Remove the exhaust pipe from the cylinder head and withdraw it. Pry out the exhaust gasket.
- 7 The heat shields (where fitted) need not be removed unless necessary.
- 8 Check the exhaust pipe and muffler for leaks, splits, cracks, holes or other damage. While some damage may be repaired by an expert using welding equipment, if the pipe or muffler are seriously corroded, or rotted internally, they must be renewed to prevent excessive noise and to preserve the machine's performance and reliability.
- 9 Repaint the system when necessary to minimise the effects of corrosion using any good quality heatproof paint; a local Kawasaki Service Agent should be able to recommend a good type.
- 10 On installation, always fit a new exhaust gasket to prevent leaks. Use a smear of grease to stick the gasket in the port. Fit the holder to the exhaust pipe, checking that it is the right way round.
- 11 Except KLT110 models – Place the two split keepers on the pipe so that their shouldered ends are outwards. Butt them against the pipe flange and wrap tape around them to hold them in place while the pipe is refitted.
- 12 Install the pipe, fit the holder over the cylinder head studs, refit the mounting nuts and tighten them lightly. KLT160 models – Refit the pipe rear mounting bolt and collar, tightening the bolt lightly.
- 13 Fit the clamp to the muffler and refit the muffler, tightening lightly its mounting bolts. Check that the pipe and muffler are aligned without stress.
- 14 Working from the front to the rear, tighten securely all mounting nuts and bolts and the muffler clamp bolt.



14.10 Always fit a new gasket to prevent exhaust leaks

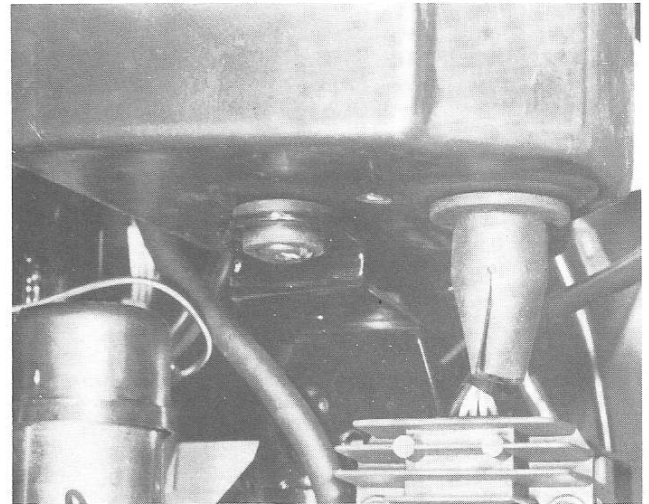
- 15 Start the engine and check that there are no exhaust leaks. Re-tighten the exhaust system mountings after the first journey, when all components have been fully warmed up and have cooled down again.

15 Spark arrester – cleaning

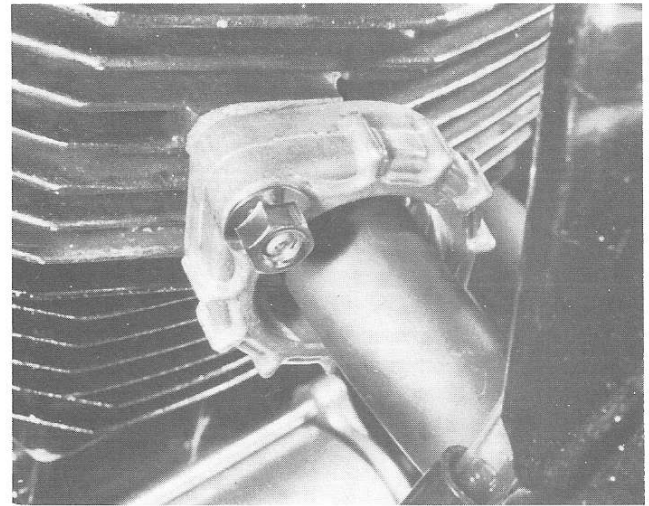
For these machines with separate spark arresters fitted, refer to Chapter 1 for details of the regular cleaning necessary.

16 Lubrication system – maintenance

Refer to the relevant Sections of Chapter 1 for details of checking the oil level, changing the oil and cleaning (or renewing) the oil filter(s).



13.7 KLT200, 250 – ensure air filter casing locating peg seats securely in frame's mounting



14.14 Tighten exhaust system front mountings first, then work back to rear clamps and mounting

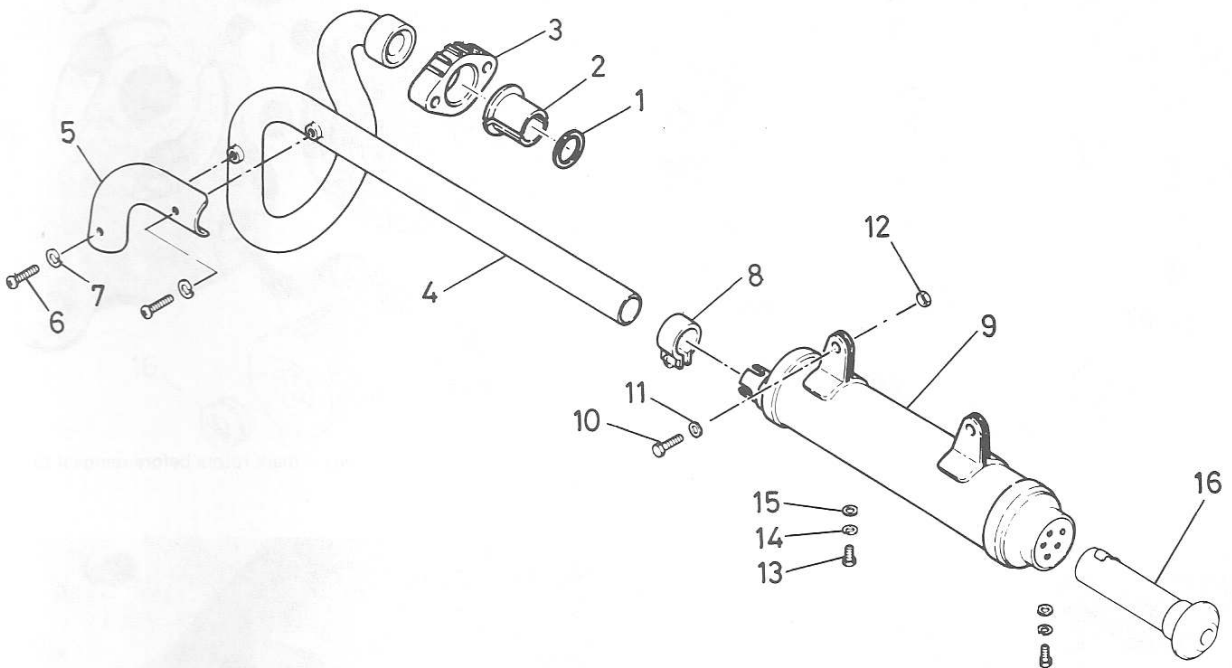


Fig. 3.13 Exhaust system – typical (Sec 14)

- | | | | |
|-----------------|-----------------|-----------|----------------------------------|
| 1 Gasket | 5 Guard | 9 Muffler | 13 Bolt |
| 2 Split keepers | 6 Screw | 10 Bolt | 14 Spring washer |
| 3 Holder | 7 Spring washer | 11 Washer | 15 Washer |
| 4 Exhaust pipe | 8 Clamp | 12 Nut | 16 Spark arrester – where fitted |

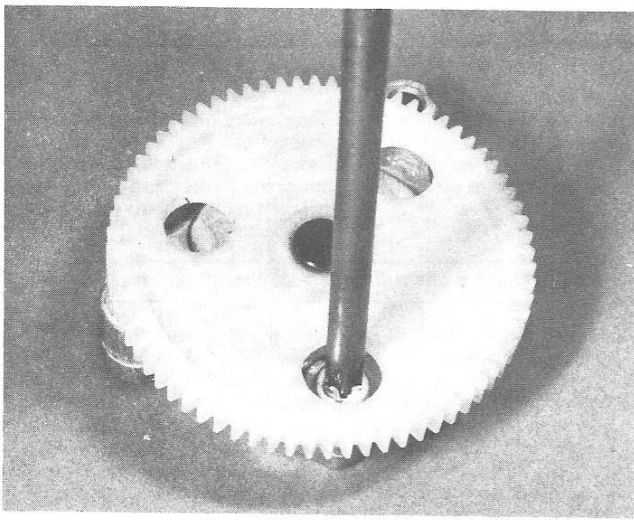
17 Oil pressure – testing – KLT200 and 250 models

- 1 Check the efficiency of the oil pump by measuring the system pressure as follows.
- 2 Change the engine oil and renew the filter element. See Chapter 1.
- 3 Warm the engine up to full operating temperature then switch off. Remove the oil passage plug and sealing washer from the oil filter cover.
- 4 Connect the pressure gauge, part number T57001-1125, to the plug orifice using the appropriate adaptor. Connect an electronic tachometer to the engine.
- 5 Start the engine and increase speed to 4000 rpm. At a temperature of 90°C (194°F) the oil pressure should be at least that specified (see Specifications). Disconnect the gauge and refit the plug and sealing washer.
- 6 If the pressure recorded is significantly lower than that specified, check the pump for wear. See Section 18.
- 7 If the pump proves to be in good condition check carefully the rest of the system, looking for oil leaks, cracks in castings, or defective seals.
- 8 If the pressure is correct, but the engine has been damaged by lack of oil, dismantle the engine to clean out all oilways and passages until the blockage is found.

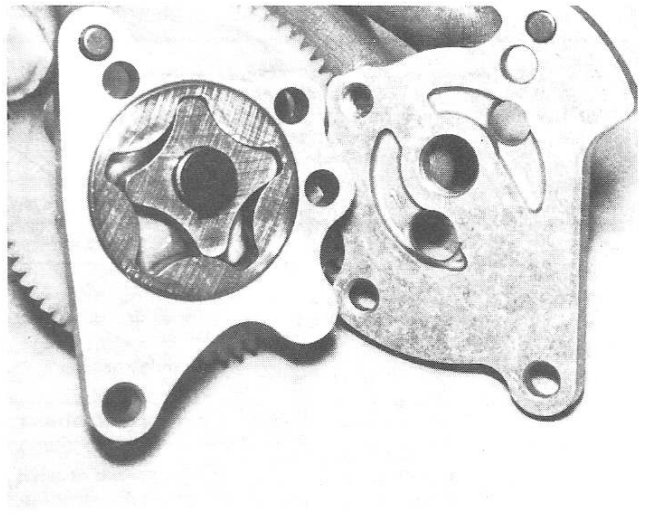
18 Oil pump – disassembly, inspection and reassembly

- 1 Remove the oil pump. See Section 23, Chapter 1.
- 2 KLT110 and 160 models – Remove from the rear of the pump the single screw and the circlip.

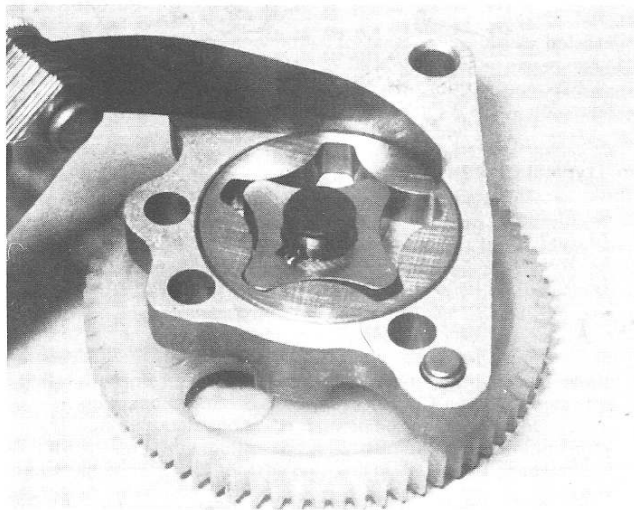
- 3 KLT200 and 250 models – Remove the single screw from the front of the pump.
- 4 Withdraw the pump cover. Mark the rotors so they can be refitted the same way using a felt-tipped marker; do not scratch or punch-mark the rotors. Withdraw the two rotors.
- 5 KLT200 and 250 models – Push the pin out of the pump shaft.
- 6 Remove the drive gear and shaft.
- 7 Wash all components in high flash-point solvent. Examine carefully each item and renew any that is damaged, worn, scored or chipped. Note that in some cases this may mean the renewal of the complete pump assembly; the rotors must be renewed always as a matched pair.
- 8 KLT200 and 250 models – The condition of the pump can be checked by measurement, as follows.
- 9 Reassemble the pump rotors and measure the clearance between the outer rotor and the pump body, using a feeler gauge. If the measurement exceeds the service limit of 0.30 mm (0.012 in) the rotor or the body must be renewed. Measure the rotor outside diameter and the body internal diameter, both in several places, to determine which is worn and must be renewed.
- 10 Measure the clearance between the outer rotor and the inner rotor, using a feeler gauge. If the clearance exceeds 0.20 mm (0.008 in) the rotors must be renewed as a set. With the pump rotors installed in the pump body, lay a straight edge across the mating surface of the pump body. Again with a feeler gauge measure the clearance between the rotor faces and the straight edge. If the clearance exceeds 0.12 mm (0.005 in) the rotors should be replaced as a set.
- 11 Reassemble the pump components by reversing the dismantling procedure. The component parts must be ABSOLUTELY clean or damage to the pump will result. Replace the rotors and lubricate them thoroughly before refitting the cover.



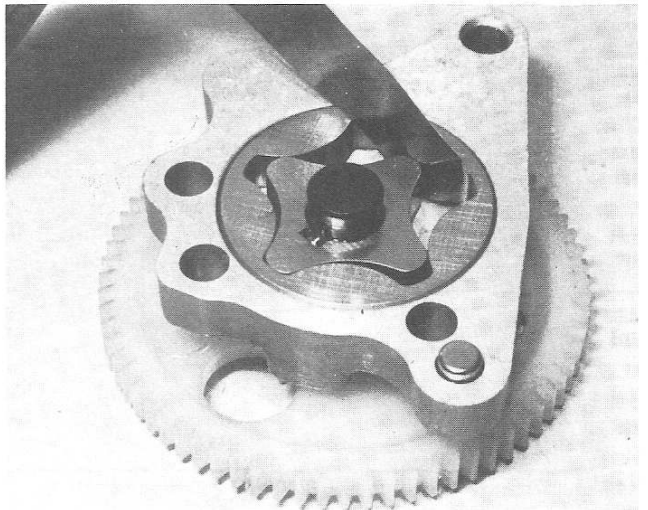
18.3 Remove single screw from front of pump – KLT200, 250 ...



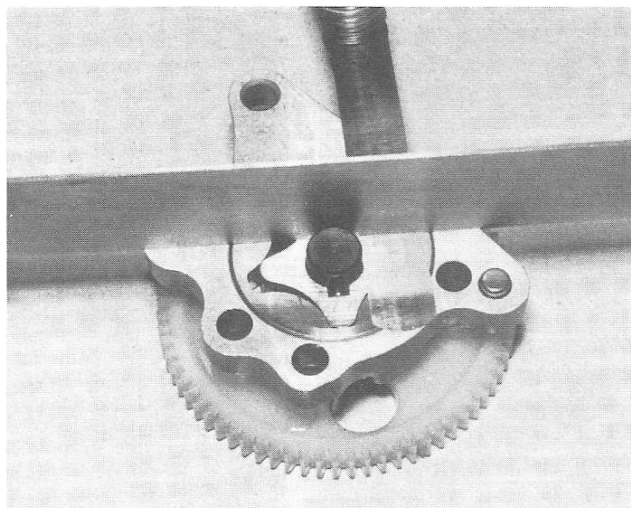
18.4 ... to release pump cover – mark rotors before removal to ensure correct refitting



18.9 Measuring outer rotor/pump body clearance



18.10a Position rotors as shown to measure inner/outer rotor clearance



18.10b Measuring rotor side clearance

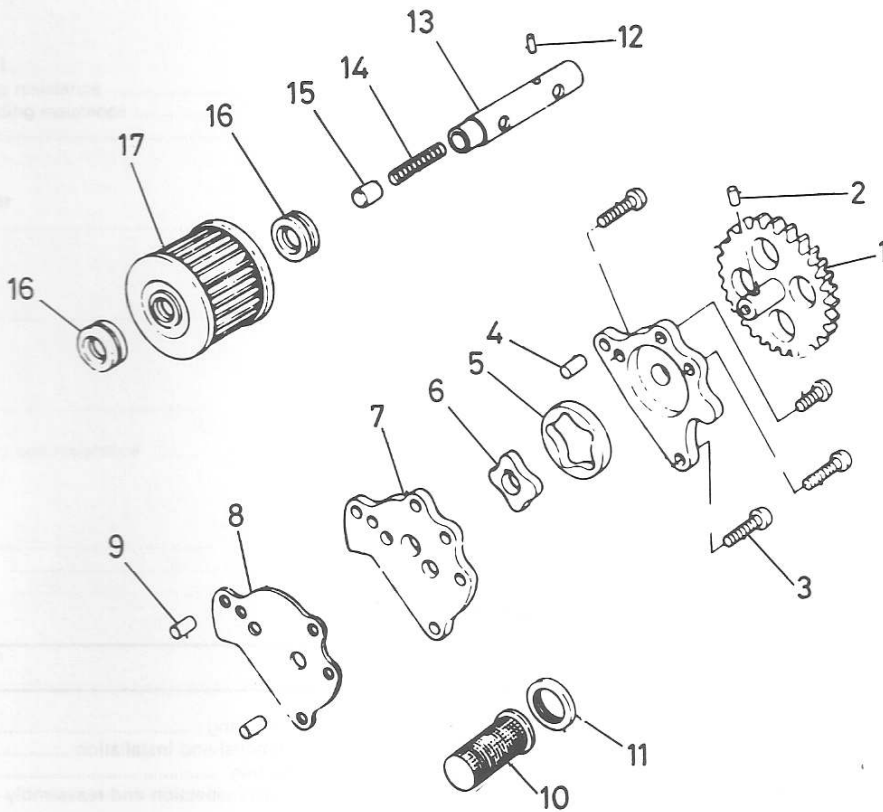


Fig. 3.14 Lubrication system components (Sec 18)

1 Drive gear	6 Inner rotor	10 Filter	14 Spring
2 Pin	7 Cover	11 Seal	15 Bypass valve
3 Screw	8 Gasket	12 Pin	16 Grommet
4 Dowel pin	9 Dowel pin	13 Mounting pin	17 Filter
5 Outer rotor			

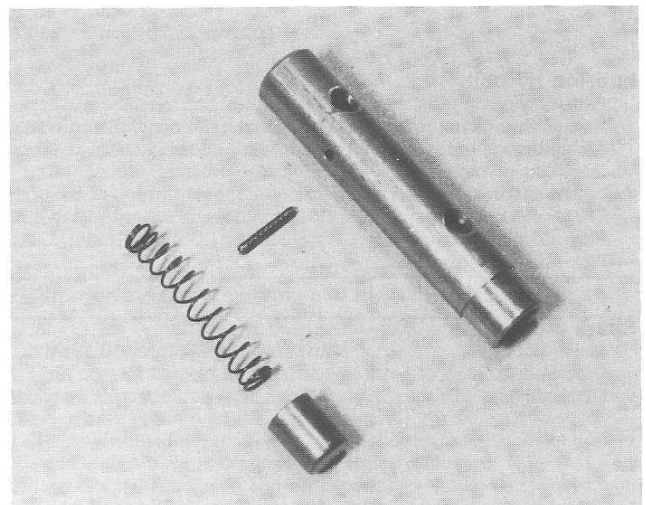
19 Bypass valve – inspection – KLT200 and 250 models

1 The bypass valve is contained in the oil filter element mounting pin and can be removed and refitted as described in Chapter 1.

2 Note that if the engine oil and filter are renewed at the specified intervals, it is unlikely that the bypass valve will ever come into operation or give trouble of any sort.

3 Its function is to ensure that the engine always receives a supply of oil (even if it is unfiltered) if the filter itself is too clogged to pass oil in sufficient quantities. The bypass valve piston is forced off its seat when subjected to extra pressure so that the oil can pass on into the engine.

4 It will be evident that diagnosis of a bypass valve fault is very difficult, but as the valve is so simple and so rarely used it is not likely to give trouble. It should be washed in high flash-point solvent whenever it is removed. If dismantling is necessary, place a wad of rag over the mounting pin open end, press out the retaining pin and tip out the spring and piston. All components should be examined for signs of wear, which should be evident, except for the spring which can only be compared with a new component, and renewed if necessary. Check that dirt is not present in the mounting pin then refit the piston, the spring and compress the spring while inserting the retaining pin.



19.4 Clean all components of bypass valve and renew any that are worn or damaged

Chapter 4 Ignition system

Contents

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Ignition timing – checking	3	Ignition/CDI unit – testing	9
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Ignition HT coil – testing	5	KLT200 A1 model	10
Source (exciter) coil – testing – KLT110 and 160 models	6	Condenser (capacitor) – testing – KLT200 A1 model	11

Specifications

	KLT110	KLT160	
Ignition system			
Type	CDI (capacitor discharge ignition)	Electronically advanced	
Ignition timing	From 10° BTDC at 1500 rpm to 35° BTDC at 4000 rpm	From 10° BTDC at 1350 rpm to 35° BTDC at 4600 rpm	
Ignition HT coil			
Primary winding resistance	0.34 to 0.52 ohm	0.18 to 0.28 ohm	
Secondary winding resistance	3.2 to 4.8 K ohm	3.2 to 4.8 K ohm	
Arcing distance	7 mm (0.275 in) or more	7 mm (0.275 in) or more	
AC generator			
Exciter coil resistance	180 to 280 ohm	100 to 190 ohm	
Pick-up coil resistance	90 to 140 ohm	90 to 160 ohm	
Pick-up coil air gap	N/App	0.7 ± 0.25 mm (0.027 ± 0.01 in)	
Spark plug			
Make	NGK	NGK	
Type	D7EA	D8EA	
Electrode gap	0.6 to 0.7 mm (0.023 to 0.027 in)	0.6 to 0.7 mm (0.023 to 0.027 in)	
Ignition system	KLT200 A1	KLT200 A2/A3 /A4/A4A	KLT200 B/C
Type	Contact breaker and coil	TCBI (Transistor controlled breakerless ignition). Electronically advanced	

	KLT200 A1	KLT200 A2/A3 /A4/A4A	KLT200 B/C
Ignition timing	From 10° BTDC at 1250 rpm to 40° BTDC at 3000 rpm	From 10° BTDC at 2250 rpm to 40° BTDC at 4000 rpm	From 10° BTDC at 1300 rpm to 40° BTDC at 4000 rpm
Ignition HT coil			
Primary winding resistance	Approx 4.2 ohm	2.4 to 3.6 ohm	2.1 to 3.2 ohm
Secondary winding resistance	Approx 11.4 K ohm	9.8 to 14.8 K ohm	10 to 16 K ohm
Arcing distance	6 mm (0.236 in) or more	6 mm (0.236 in) or more	N/Av
Contact breaker			
Gap	0.3 to 0.4 mm (0.012 to 0.016 in)	N/App	N/App
Capacitor			
Capacity	0.25 ± 0.03 microfarad	N/App	N/App
AC generator			
Output	141 W at 10 000 rpm	141 W at 10 000 rpm	141 W at 10 000 rpm
Pick-up (pulser) coil resistance	N/App	590 to 710 ohm	390 to 590 ohm
Spark plug			
Make	KLT200 – all models NGK or ND		
Type	B7ES or W22ES-U		
Electrode gap	0.7 to 0.8 mm (0.027 to 0.032 in)		
Ignition system			
Type	KLT250 TCBI (Transistor controlled breakerless ignition). Electronically advanced		
Ignition timing			
250 A1	From 10° BTDC at 1250 rpm to 40° BTDC at 4000 rpm		
250 A2/C/P	From 10° BTDC at 1300 rpm to 40° BTDC at 4000 rpm		
Ignition HT coil			
Primary winding resistance	2.1 to 3.2 ohm		
Secondary winding resistance	10 to 16 K ohm		
AC generator			
Output	141 W at 10 000 rpm		
Pick-up (pulser) coil resistance	250 A1 570 to 850 ohm 250 A2, C, P 390 to 590 ohm		
Spark plug			
Make	NGK or ND		
Type	B8ES or W24ES-U		
Electrode gap	0.7 to 0.8 mm (0.027 to 0.031 in)		

1 General information

The KLT110 and 160 models use a CDI (Capacitor Discharge Ignition) system, the components of which are a source (exciter) coil mounted on the generator stator, a pickup (pulser) coil, and a CDI unit.

KLT200 A1 machines employ a conventional battery and coil contact breaker triggered system. Note that the only components of this system described in this Chapter are the ignition HT coil, the advancer assembly and the condenser (capacitor). Refer to Chapter 1 for details of contact breaker and spark plug maintenance.

All other KLT200 models and all KLT250 models are fitted with a transistor-controlled breakerless ignition system which is powered by the battery and triggered by a pickup (pulser) coil mounted outside the generator rotor.

The conventional mechanical advance system with contact breaker points has been replaced by electronic components which virtually eliminate ignition system adjustment and maintenance.

The components are easily checked, but not repaired. Once the faulty component is isolated, the only choice is to replace the part with

a new one. Keep in mind that most electrical parts cannot be returned, so be absolutely certain that the part you buy is the part you need.

Due to the fact that special tools, training and experience are required to check the ignition system components, the job is best left to a dealer service department or a reputable motorcycle repair shop.

2 Ignition system – locating and identifying faults

Contact breaker ignition system

1 The contact breaker ignition system fitted to KLT200 A1 models is extremely simple in operation and is usually reliable. It has the advantage of being easy to put right if a fault occurs.

2 If a fault should occur, use the Troubleshooting section at the front of this Manual to trace it, working in a logical sequence. Note that as a general rule the spark plug and suppressor cap should be checked first, followed by the contact breaker, the wiring and finally the HT coil and condenser. Refer to the appropriate Sections of Chapter 1 or of this Chapter for information on the components concerned.

Electronic ignition system

3 Although equally simple in principle and requiring much less maintenance than contact breaker systems, this type of electronic ignition requires a more sophisticated approach when tracing faults. For this reason the accompanying sequence of checks should be used as a guide to working methodically through the system until the fault is found.

4 Make sure the ignition kill switch is in the On position.

5 Remove the spark plug, hook up the plug lead and lay the plug on the engine with the threads contacting the cylinder cooling fins. Crank the engine over and make sure a well-defined, blue spark occurs between the spark plug electrodes.

6 If no spark occurs, or if the spark is weak, substitute a new spark plug and repeat the test. If the spark is still not satisfactory, the following checks should be made.

7 Unscrew the spark plug cap from the plug wire and check the cap resistance with an ohmmeter. If the resistance is infinite, replace it with a new one.

8 Make sure all electrical connectors are clean and tight. Check all wires for shorts, opens and correct installation.

9 Check the ignition timing (if the engine will run).

10 Referring to the appropriate Sections, check the ignition HT coil, then the pickup (pulsar) coil. On KLT110 and 160 models only, check the source (exciter) coil.

11 Check the ignition/CDI unit.

12 Check the generator rotor external magnets are not chipped or grooved, renewing the rotor if damage is found (KLT200 and 250). All models – check that the rotor key has not sheared, and that the rotor is correctly installed and securely fastened on the crankshaft.

3 Ignition timing – checking

1 KLT110 and 160 models – Remove the timing inspection plug from the crankcase left cover.

2 KLT200 and 250 models – Remove the inspection cover from the crankcase left cover and substitute a clear plastic plate (using shorter screws) to prevent the escape of oil. See Chapter 1.

3 Following the manufacturer's instructions, connect a strobe timing light and a tachometer. Start the engine, allow it to idle and point the timing light at the inspection aperture.

4 At idle speed up to a specified engine speed (see Specifications) the crankcase index mark should align exactly with the generator rotor 'F' mark. This is marked as such on KLT200 and 250 models (see the illustration in Chapter 1), but on KLT110 and 160 models it is the stamped line immediately next to the 'T' mark.

5 From the specified speed onwards the electronic advance circuit should begin to function, moving the timing marks until at 4/5000 rpm (see Specifications) the ignition is fully advanced and the crankcase index mark is aligned with the single stamped line of the full advance mark (KLT110 and 160) or is between the two parallel lines of the full advance mark (KLT200 and 250).

6 If the ignition timing is incorrect, there is a fault in the system; as there is no provision for adjustment. Proceed as follows:

7 Check that all components are correctly installed and securely fastened. See Chapter 2.

8 Renew the CDI/ignition unit (as applicable).

4 Ignition HT coil – removal and installation

KLT110 and 160 models

1 Disconnect the spark plug cap and pull the single black or green/white wire off its spade terminal.

2 Remove the two mounting screws or nuts.

3 Withdraw the coil.

4 On installation, carefully clean the coil mounting points to ensure a good earth and do not forget to fit the black/yellow wire terminal under one of the screws or nuts. There must be good ground contact at this point.

KLT200 A1 models

5 Remove the seat and front cover. See Chapter 5.

6 Disconnect the spark plug cap and the two low-tension wires.

7 Remove the two locknuts and withdraw the coil.

8 On installation, carefully clean the coil mounting points to ensure a good ground. The spark plug lead should point to the right and the condenser (capacitor) should be retained by the left locknut.

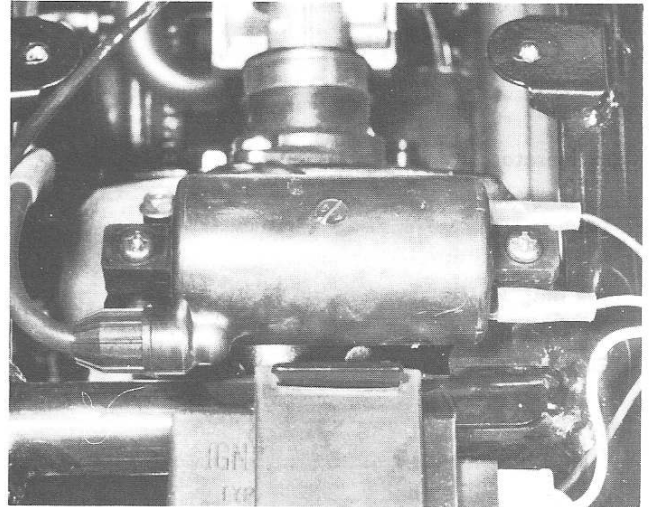
All other KLT200 models and KLT250.

9 Remove the seat and front cover. See Chapter 5.

10 Disconnect the spark plug cap and the two wires.

11 Remove the two nuts and withdraw the coil.

12 On installation carefully clean the coil mounting points to ensure a good ground. Connect the yellow/red wire to the spade terminal on the same side of the coil as the spark plug lead; the black wire connects to the remaining terminal.



4.9 Location of ignition HT coil – all KLT200 except A1, KLT250

5 Ignition HT coil – testing

1 The ignition coil is a type of transformer which develops the voltage required to jump the spark plug gap. Maintain the coil by keeping the electrical connections clean and tight, and occasionally checking to see that the coil is securely mounted.

2 Ignition coil testing is best left to an authorized Kawasaki dealer who has the special equipment. However, you can test it yourself if you have access to an ohmmeter or a multimeter. The coil does not have to be removed from the machine.

3 The most accurate method of testing the coil is to remove it from the machine (see Section 4) and to connect it to a spark gap tester or to an electrotester, Part Number 57001-980.

4 Connect the coil to the tester when the unit is switched on, and open out the adjusting screw on the tester to the distance specified (see Specifications). The spark at this point should bridge the gap continuously. If the spark starts to break down or is intermittent, the coil is faulty and should be renewed.

5 In the absence of a coil tester, the winding may be checked for broken or shorted windings using a multimeter, noting that the test will not reveal insulation breakdown which may only be evident under high voltage.

6 The primary winding resistance can be measured by connecting the meter probes between the two low tension terminals (KLT200 and 250), or between the single terminal and the coil core. Set the meter to the ohm x 1 scale and note the reading obtained. If this is significantly different from that specified, the coil is faulty and should be renewed.

7 To check the secondary windings, unscrew the cap from the spark plug lead and set the meter to the ohm x 1000 (k ohms) scale. Connect one meter probe to the spark plug lead end. The other probe is connected to the coil core (KLT110 and 160), to the yellow/red wire spade terminal (KLT200 A1), or to the black wire spade terminal (all other KLT200 models and KLT250). Again, if the reading obtained differs significantly from that specified, the coil must be renewed.

8 Finally check for continuity between the low tension lead and the coil core, followed by the high tension lead, repeating the test with the second low tension lead. If anything other than infinite resistance (insulation) is shown, the coil must be renewed.

9 Remember that the insulation tests can only serve as a guide to the coil's condition. If the tests give the correct readings, the coil may be in sound condition, but this can only be checked by testing its performance on a spark gap tester, as described above.

6 Source (exciter) coil – testing – KLT110 and 160 models

- 1 KLT110 models – Disconnect the red wire from the generator.
- 2 KLT160 models – Disconnect the source coil two-pin connector from the generator.
- 3 Set the meter to the ohm x 10 range. Connect one meter probe to the red wire terminal (from the generator) and the other to a good ground contact (KLT110) or to the black/red wire terminal (KLT160).
- 4 If the reading obtained differs widely from that specified (see Specifications) the coil is faulty and must be renewed, as follows:
- 5 KLT110 models – Remove the generator stator (see Chapter 2). The coil connection can then be unsoldered and the retaining screws removed to release the coil. If you cannot be sure of soldering the joint securely on installation, have a new coil fitted by an expert at a Kawasaki Service Agent.
- 6 KLT160 models – Remove the generator stator, which is mounted on the inside of the crankcase left cover (see Chapter 2). The complete stator assembly must be renewed.

7 Pickup (pulser) coil – testing

KLT110 models

- 1 Disconnect the three-pin connector from the generator.
- 2 Set the meter to the ohm x 10 scale and measure the resistance between the brown and white wire terminals. If the reading obtained differs widely from that specified, the coil is faulty and must be renewed, as follows:
- 3 Remove the generator stator (see Chapter 2). The coil connections can then be unsoldered and the retaining screws removed to release it. If you cannot be sure of soldering the joint securely on installation, have the new coil fitted by an expert at a Kawasaki Service Agent.

KLT160 models

- 4 Disconnect the pickup coil two-pin connector from the generator.
- 5 Set the meter to the ohm x 10 scale and measure the resistance

between the black and black/yellow wire terminals. If the reading obtained differs widely from that specified (see Specifications) the coil is faulty and must be renewed, as follows:

- 6 Remove the recoil starter and crankcase left cover. See Chapter 2. Remove its mounting screws and withdraw the coil.
- 7 On installation, tighten the screws lightly and rotate the generator rotor until the timing projection is aligned with the coil. Use feeler gauges to measure the gap between the coil pole and the rotor projection. If the gap is not as specified, slide the coil in or out until the gap is correct, then tighten the screws. Re-check the gap.

KLT200 and 250 models

- 8 Remove the front cover. See Chapter 5.
- 9 Disconnect the pulser coil two-pin connector, tracing the lead from the crankcase top to behind the steering head.
- 10 Set the meter to the ohm x 100 scale and measure the resistance between the green and red wire terminals. If the reading obtained differs widely from that specified, the coil is faulty and must be renewed, as follows:
- 11 Remove the crankcase left cover. See Chapter 2.
- 12 Remove the two retaining screws and withdraw the coil.
- 13 On installation, check that the coil wires sealing grommet is in good condition, or oil leaks may result. If necessary apply a smear of Loctite Silicone RTV (part number K61079-007) or similar to the grommet to ensure an oil-tight fitting.

8 Ignition/CDI unit – removal and installation

KLT110 models

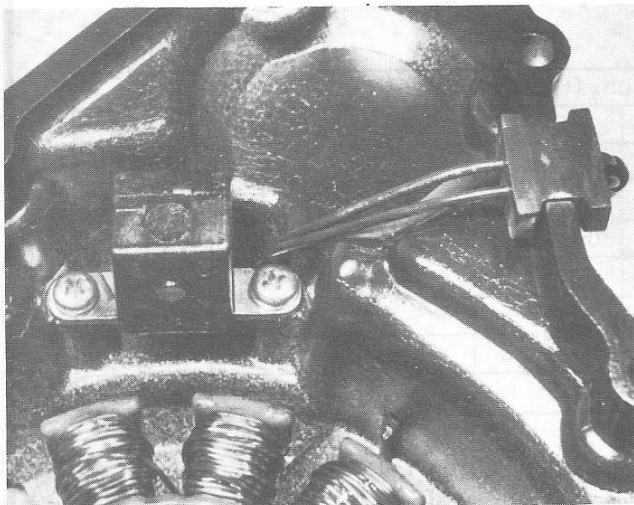
- 1 Remove the fuel tank. See Chapter 3.
- 2 Disconnect the CDI unit leads.
- 3 Pull the unit off its mounting at the rear of the steering head.
- 4 Installation is the reverse of removal.

KLT160 models

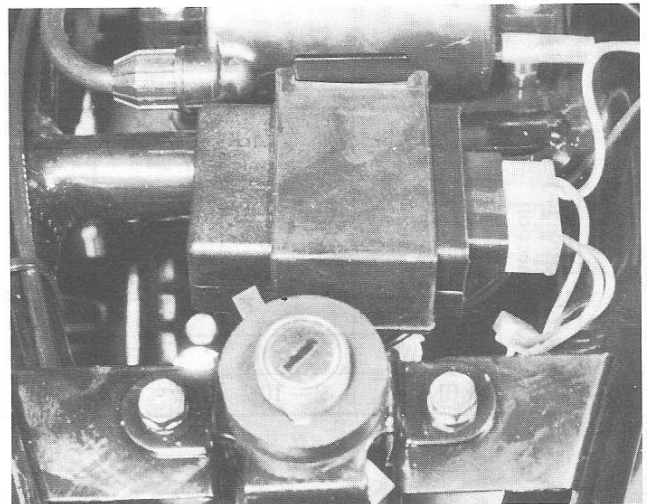
- 5 Remove the seat and rear fender. See Chapter 5.
- 6 Disconnect the CDI unit leads.
- 7 Remove the screw and locknut and withdraw the unit, noting the damper and collar. Installation is the reverse of removal.

KLT200 and 250 models

- 8 Remove the front cover and storage case (if fitted). See Chapter 5.
- 9 Disconnect the unit block connector.
- 10 Pull the rubber mounting off the frame bracket and peel off the rubber. Installation is the reverse of removal.



7.13 Ensure rubber grommet seals correctly on refitting pickup (pulser) coil



8.8 Location of ignition unit – all KLT200 except A1, KLT250

9 Ignition/CDI unit – testing

- 1 Use only the Kawasaki tester, part number 57001-983, set to the ohms x 1000 (1 K ohm) scale to test the unit. Other equipment can be used but may not give the same readings, and the scale to be used must be determined by trial and error.
- 2 **Note:** it is easy to damage the unit by using equipment of the wrong type to test it, or by making the wrong test connections. It is recommended that the unit be removed from the machine (see Section 8) and taken to a Kawasaki Service Agent for testing by an expert using the correct equipment.
- 3 To test the unit make the meter probe connections as shown in the relevant accompanying chart. If any reading differs from that shown, the unit is faulty and must be renewed.

10 Advancer – disassembly, inspection and reassembly – KLT200 A1 models

- 1 Remove the assembly. See Section 6, Chapter 2.
- 2 Holding the centre, twist the cam counterclockwise and pull it off.

Displace the circlips, remove the first thrust washers and lift off the bobweights, unhooking each spring to release the weights. Remove the second thrust washers.

3 Wash each part in solvent, taking care that all residual grease is removed from the groove inside the cam. Check the pivot pins and the corresponding holes in the bobweights. If these are badly worn, inaccurate timing will be unavoidable and a new advancer must be fitted. Similarly, the complete unit must be renewed if the return springs are weak or broken, or if there is excessive wear on the inside or outside of the cam.

4 Fill the cam internal groove with high melting point grease and apply a light smear to the pivot posts and cam bearing surface. Refit the cam aligning the mark on its outer end with the notch in the advancer body.

5 Fit a thrust washer over each pivot post, followed by the bobweights, ensuring that their springs are correctly engaged. Fit the second thrust washer to each post and secure it by refitting a circlip to each. Lubricate the bobweight bearing surfaces with a few drops of light machine oil.

6 Check the unit's operation. The cam should move smoothly and easily clockwise until the bobweights contact their raised stops, and should return quickly and smoothly under spring pressure to the full retard position when released.

		Meter Positive (+) Lead Connection				
Lead (Lead Color)		Pickup Coil (White)	Pickup Coil (Chocolate)	Ground (Black/Yellow)	Ignition Coil (Black)	Exciter Coil (Red)
Meter Negative (-) Lead Connection	Pickup Coil (White)		40 – 160 kΩ	40 – 160 kΩ	∞	60 – 500 kΩ
	Pickup Coil (Chocolate)	30 – 150 kΩ		0 Ω	∞	1 – 6 kΩ
	Ground (Black/Yellow)	30 – 150 kΩ	0 Ω		∞	1 – 6 kΩ
	Ignition Coil (Black)	60 – 240 kΩ	1 – 6 kΩ	1 – 6 kΩ		5 – 20 kΩ
	Exciter Coil (Red)	250 – 1,000 kΩ	60 – 240 kΩ	60 – 240 kΩ	∞	

Fig. 4.1 Testing the CDI unit – KLT110 (Sec 9)

		Meter Positive (+) Lead Connection						
Lead Color		R	BK/R	BK	BL	G/W	BK/W	BK/Y
Meter Negative (-) Lead Connection	R		∞	∞	∞	∞	∞	∞
	BK/R	25 – 180		10 – 50	10 – 50	∞	35 – 180	10 – 50
	BK	2 – 10	2 – 10		0.1 – 0.4	∞	2 – 10	0.1 – 0.4
	BL	2 – 9	2 – 10	0.1 – 0.4		∞	2 – 10	0
	G/W	∞	∞	∞	∞		∞	∞
	BK/W	0	∞	∞	∞	∞		∞
	BK/Y	2 – 10	2 – 10	0.1 – 0.4	0	∞	2 – 10	

Fig. 4.2 Testing the CDI unit – KLT160 (Sec 9)

		Tester (-) Lead				
		Battery	Ig. Coil	Ground	PC (+)	PC (-)
Tester (+) Lead	Battery		∞	410~620 Ω	∞ †	410~620 Ω
	Ig. Coil	1.1~1.6 k Ω		300~460 Ω	∞ †	300~460 Ω
	Ground	460~680 Ω	∞		∞ †	0 Ω
	PC (+)	16~24 k Ω	∞	16~24 k Ω		16~24 k Ω
	PC (-)	460~680 Ω	∞	0 Ω	∞ †	

†The meter needle moves very slightly.

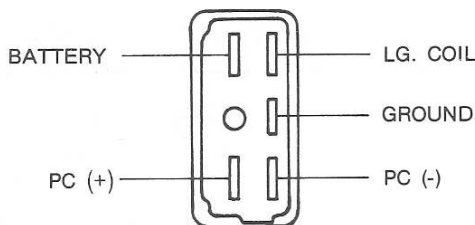


Fig. 4.3 Testing the ignition unit - KLT200 and 250 (Sec 9)

11 Condenser (capacitor) - testing - KLT200 A1 models

- 1 Remove the seat. See Chapter 5.
- 2 Remove the front cover. See Chapter 5.
- 3 Disconnect the condenser black wire, remove the ignition HT coil left mounting locknut, and remove the condenser.
- 4 If the engine proves difficult to start, or misfiring occurs, especially

when the engine is hot, it is possible that the condenser is at fault. To check, separate the contact points by hand when the ignition is switched on. If a spark occurs across the points as they are separated by hand and they have a burnt or blackened appearance, the condenser can be regarded as unserviceable.

5 Test the condenser on a coil and condenser tester unit or alternatively fit a new replacement. In view of the small cost involved it is preferable to fit a new condenser, and observe the effect on engine performance as a result of the substitution.

Chapter 5 Frame and front forks

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Specifications

Frame	KLT110 A1	KLT110 A2, KLT160	
Type	Welded tubular steel	Welded tubular steel	
Front forks			
Type	Rigid, welded tubular steel	Oil damped, telescopic	
Travel	N/App	80 mm (3.15 in)	
Oil capacity (per leg):			
After reassembly	N/App	88.0 ± 2.5 cc (2.97 ± 0.08 US fl oz)	
Oil change	N/App	75 cc (2.54 US fl oz)	
Oil level (fully compressed)	N/App	140 mm (5.5 in)	
Torque wrench settings – kgf m (lbf ft)			
Component			
Handlebar clamp bolts	1.8 (13.0)	N/Av	
Fork top bolts	3.0 (22.0)	3.0 (22.0)	
Steering stem top bolt	5.5 (40.0)	5.5 (40.0)	
Steering head bearing lock ring	2.0 (14.5)	2.0 (14.5)	
Fork yoke pinch bolts	N/App	3.0 (22.0)	
Fork leg damper rod retaining bolts	N/App	2.0 (14.5)	
Fork leg oil drain screws	N/App	0.75 (5.5)	
Wheel spindle clamp nuts	N/App	1.0 (7.2)	
Frame	KLT200 A1/A2	KLT200 C	KLT250
Type	/A3/A4/A4A/B Duplex spine, welded tubular steel		Duplex cradle, welded tubular steel
Front forks			
Type	Rigid, welded tubular steel	Leading link, controlled by shock absorbers	
Travel	N/App	N/Av	66 mm (2.6 in)
Arm pivot bush to sleeve clearance	N/App	0.05 to 0.10 mm (0.002 to 0.004 in)	0.05 to 0.10 mm (0.002 to 0.004 in)
Service limit	N/App	0.5 mm (0.02 in)	0.5 mm (0.02 in)

Torque wrench settings – kgf m (lbf ft)

Component

	KLT200 A1/A2 /A3/A4/A4A/B	KLT200 C	KLT250
Fork top bolts	3.0 (22.0)	3.0 (22.0)	3.0 (22.0)
Steering stem top bolt	5.5 (40.0)	5.5 (40.0)	5.5 (40.0)
Steering head bearing lock ring	2.0 (14.5)	2.0 (14.5)	2.0 (14.5)
Shock absorber mounting bolts	N/App	3.0 (22.0)	3.0 (22.0)
Stopper bolts	N/App	3.0 (22.0)	3.0 (22.0)
Arm pivot bolt nuts	N/App	8.0 (59.0)	8.0 (59.0)
Footrest bar mounting bolts	1.8 (13.0)	1.8 (13.0)	N/App

1 General information

The front forks are rigid on KLT110 A1 and all KLT200 A and B models. KLT110 A2 and KLT160 models are fitted with telescopic forks and all other models are fitted with leading link forks.

The frame is of welded tubular steel and has no rear suspension, the rear axle being bolted solidly to the frame rear end.

2 Frame – inspection

1 The frame is unlikely to require attention unless accident damage has occurred. In some cases, renewal of the frame is the only satisfactory remedy if the frame is badly out of alignment. Only a few frame specialists have the jigs and mandrels necessary for resetting the frame to the required standard of accuracy, and even then there is no easy means of assessing to what extent the frame may have been over-stressed.

2 After the machine has covered a considerable mileage, it is advisable to examine the frame closely for signs of cracking or splitting at the welded joints. Rust corrosion can also cause weakness at these joints. Minor damage can be repaired by welding or brazing, depending on the extent and nature of the damage.

3 Remember that a frame which is out of alignment will cause handling problems and may even promote 'speed wobbles'. If misalignment is suspected, as a result of an accident, it will be necessary to strip the machine completely so that the frame can be checked, and if necessary, renewed.

3 Front fork assembly – removal and installation

- 1 Remove the front wheel. See Chapter 6.
- 2 Remove its mounting bolts and nuts and withdraw the front fender.
- 3 Disconnect the headlamp wiring and remove the headlamp.
- 4 KLT110 and 160 models – Remove the fuel tank. See Chapter 3.
- 5 KLT200 and 250 models – Remove the front cover and storage case.
- 6 Disconnect the control cables and wiring, remove the four clamp bolts and remove the handlebars.
- 7 Except KLT110 A1, KLT200 A and B models – Remove the front suspension components. See Section 5.
- 8 Remove the two steering stem head bracket bolts and the stem head bolt. Lift off the bracket.
- 9 Supporting the fork assembly, unscrew the steering stem nut. Lift off the bearing dust cover and the top bearing inner race.
- 10 Catching the balls of the bottom race in a drain pan as they drop clear, lower the steering stem until it is clear of the frame and remove the fork assembly. Remove the top race steel balls.
- 11 There are twenty-three $\frac{3}{16}$ in (6 mm) balls in the top race and nineteen $\frac{1}{4}$ in (8 mm) balls in the bottom race.
- 12 On installation, use grease to stick the ball bearings in place on the bottom bearing inner race and in the top bearing outer race. Slide the fork assembly into the steering head, taking care not to dislodge any balls, then refit the top bearing inner race, the dust cover and the adjusting nut.
- 13 Tighten the nut until it is snug then back it off slightly. Make sure the stem rotates freely with no discernible vertical play.
- 14 Reverse the removal procedure to install the remaining components tightening all nuts and bolts to their specified torque settings.
- 15 When the forks are reinstalled, check the steering head bearing adjustment (See Chapter 1).

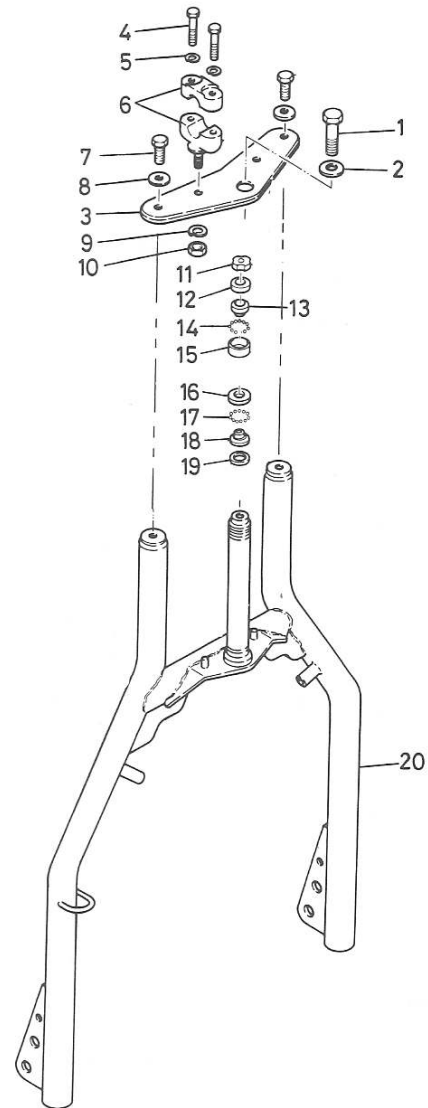
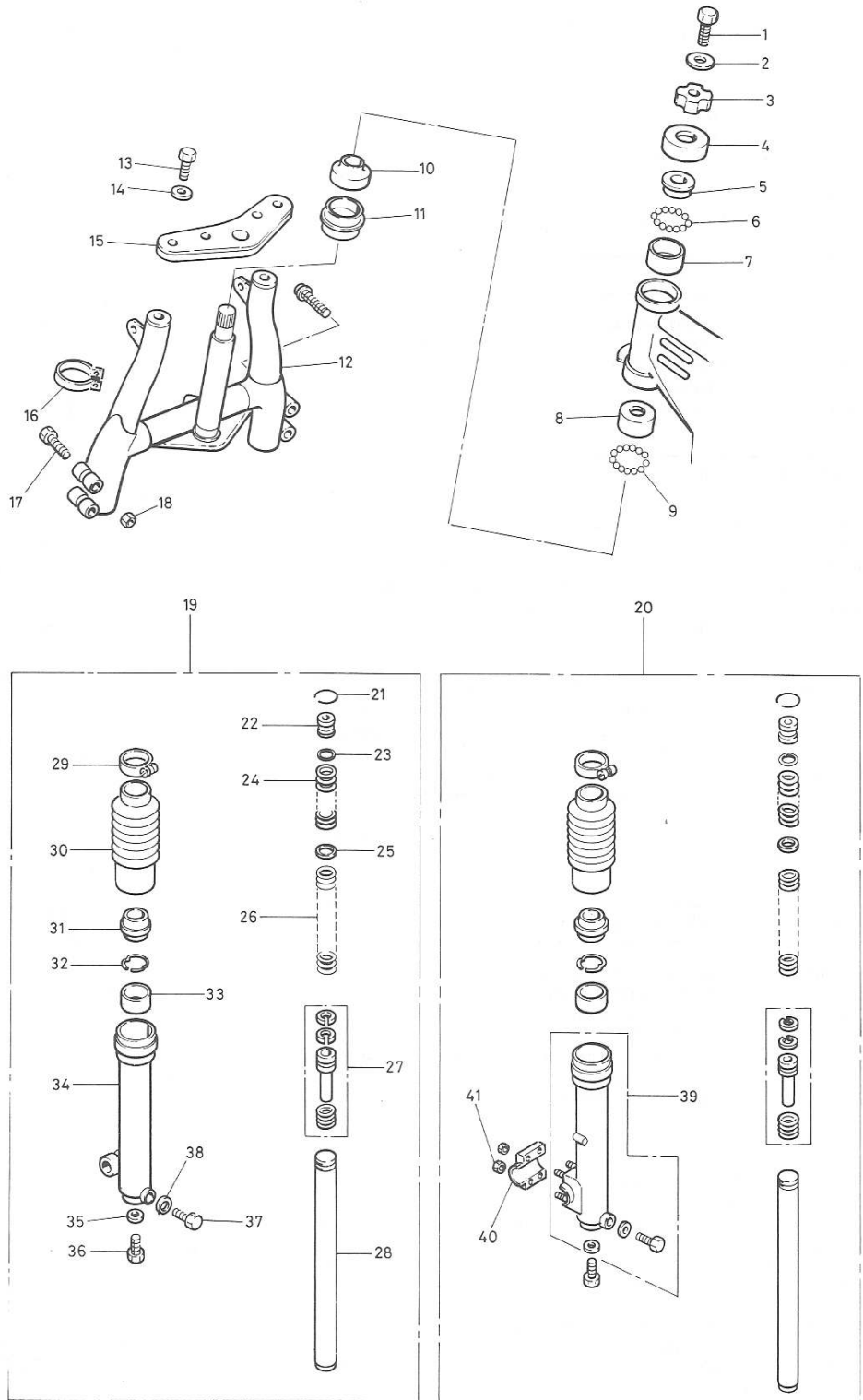


Fig. 5.1 Front fork and steering head – KLT110 A1, KLT200 A, B – typical (Sec 3)

- | | |
|---------------------|------------------------------|
| 1 Stem head bolt | 11 Stem nut |
| 2 Washer | 12 Dust cover |
| 3 Stem head bracket | 13 Top bearing inner race |
| 4 Bolt | 14 Steel balls |
| 5 Washer | 15 Top bearing outer race |
| 6 Handlebar holder | 16 Bottom bearing outer race |
| 7 Bolt | 17 Steel balls |
| 8 Washer | 18 Bottom bearing inner race |
| 9 Spring washer | 19 Seal |
| 10 Nut | 20 Front forks/steering stem |

- 1 Stem head bolt
- 2 Washer
- 3 Stem nut
- 4 Dust cover
- 5 Top bearing inner race
- 6 Steel balls
- 7 Top bearing outer race
- 8 Bottom bearing outer race
- 9 Steel balls
- 10 Bottom bearing inner race
- 11 Seal
- 12 Steering stem
- 13 Bolt
- 14 Washer
- 15 Stem head bracket
- 16 Cable tie
- 17 Bolt
- 18 Nut
- 19 Left fork assembly
- 20 Right fork assembly
- 21 Retaining ring
- 22 Top plug
- 23 O-ring
- 24 Upper spring
- 25 Washer
- 26 Lower spring
- 27 Damper piston assembly
- 28 Inner tube
- 29 Clamp
- 30 Rubber boot
- 31 Dust seal
- 32 Retaining ring
- 33 Dust seal
- 34 Left slider
- 35 Washer
- 36 Allen bolt
- 37 Drain plug
- 38 Washer
- 39 Right slider
- 40 Axle clamp
- 41 Nut



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Fig. 5.2 Front forks – KLT110 A2 and KLT160 (Sec 3)

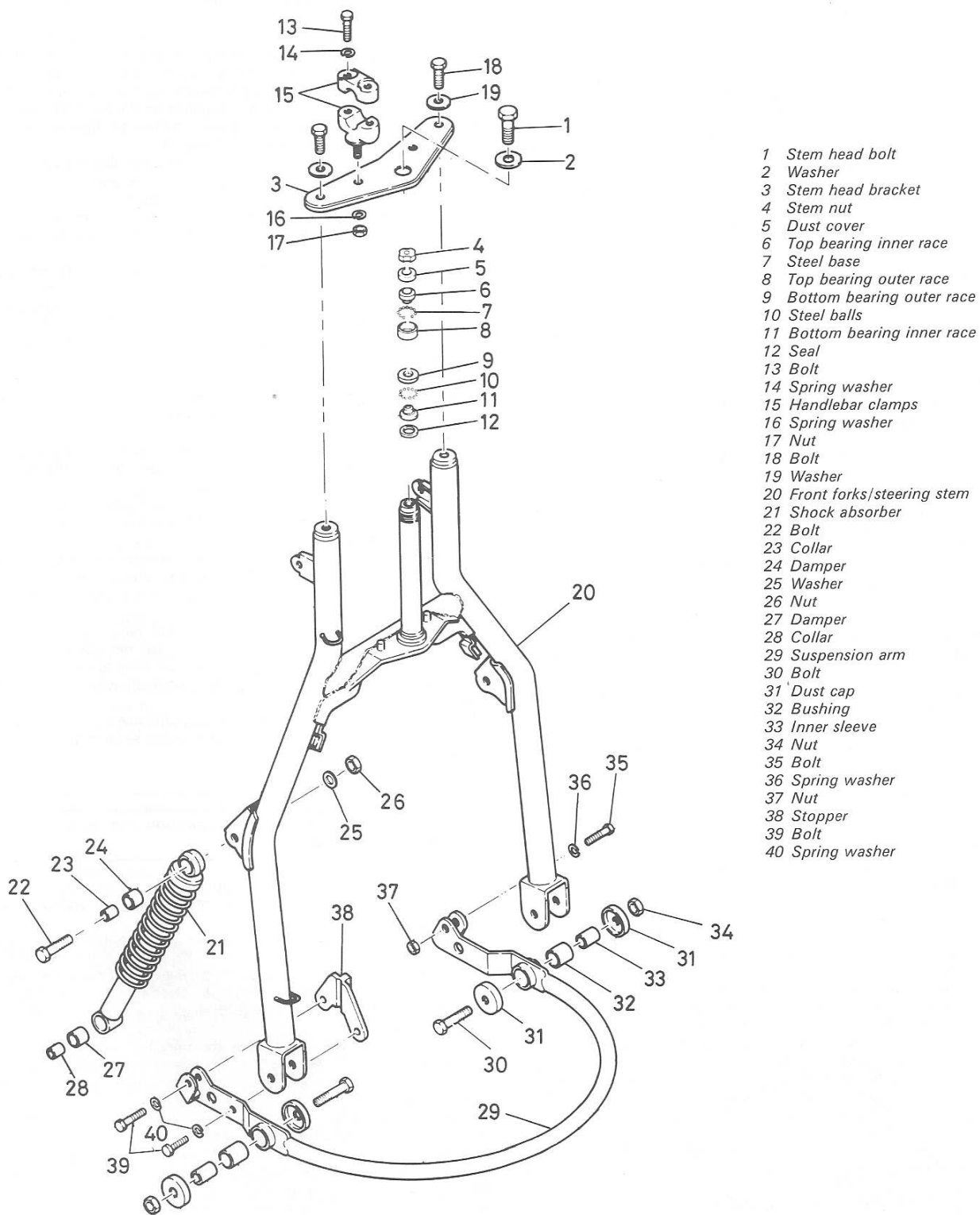


Fig. 5.3 Front forks – KLT200 C and KLT250 (Sec 3)

4 Steering head – inspection

- 1 Remove the front forks. See Section 3.
- 2 The ball bearing tracks of the respective races should be polished and free from indentations, cracks or pitting. If signs of wear are evident, the inner and outer races must be renewed. For straight line steering to be consistently good, the steering head bearings must be absolutely perfect. Even the smallest amount of wear on the races may cause steering wobble at high speeds and judder during heavy front wheel braking. The races are an interference fit on their respective seatings, and can be tapped from position with a suitable drift.
- 3 Ball bearings are relatively cheap. If the originals are marked or discoloured they **must** be renewed. To hold the steel balls in place during reassembly, pack the bearings with grease. The upper race uses 23 ³/₁₆ in (6 mm) balls, the lower race was 19 ¹/₄ inch (8 mm) balls. Although a small gap will remain when the balls have been fitted, on no account must an extra ball be inserted, as the gap is intended to prevent the balls from skidding against each other and wearing quickly.
- 4 The bottom bearing inner race can be levered off its seat on the steering stem, followed by the rubber seal and metal washer; these last should be renewed if worn or damaged in any way. On reassembly, refit first the metal washer, then the seal and use a length of metal tubing, only slightly larger in its internal diameter than the steering stem, as a tubular drift to tap the race firmly on to its seat. The bearing outer races can be tapped into place using a socket spanner or similar as a drift; the drift must bear only on the race outer edge, not on its bearing surface.
- 5 On reassembly, pack grease around the bottom bearing inner race and stick the balls to it as described in Section 3. Grease the inside of the headstock and the steering stem to prevent corrosion. Pack grease into the top bearing outer race, refit the balls and place the top inner race in position. Remember to hold the race steady while the fork assembly is refitted.
- 6 Inspect the fork assembly and steering stem top bracket for cracks or distortion of any sort. Do not attempt to repair any steering components; replace them with new parts if any defects are found.

5 Front suspension – removal, inspection and installation – KLT110 A2 and KLT160 models

- 1 Remove the front wheel. See Chapter 6.
- 2 Slacken the two clamp bolts securing each leg, then remove the upper bolt.
- 3 Remove the fork legs. Dismantle the legs separately to avoid mixing components.
- 4 Slacken its clamp and pull off the rubber boot.
- 5 Holding the leg upright, depress the top plug to allow the retaining ring on the inside of the inner tube to be pried out.
- 6 Slowly allow the fork spring pressure to drive out the top plug. Wrap the top of the inner tube with rag to prevent the plug from flying out and causing damage or personal injury.
- 7 **Caution:** *The fork plugs are under spring pressure. Be very careful when removing them to prevent damage and injury.*
- 8 Remove the fork plug. Pull out the upper spring, then invert the fork tube over a clean drain pan and remove the washer and lower spring while draining the fork oil into the pan. Pump the fork tube and slider a few times to ensure complete draining.
- 9 Carefully clamp the slider in the vise (cushion it with a rag) and remove the Allen head bolt from the bottom of the fork leg. Don't apply any more pressure to the slider than is absolutely necessary as it can be easily damaged. If the bolt is difficult to remove, temporarily install the springs and fork cap. The threads on the bolt should be cleaned thoroughly with a wire brush to remove any traces of thread locking compound.
- 10 Remove the fork leg from the vise, pull out the inner tube and catch the damper piston assembly as it slides out of the tube. Use an appropriate size tap to remove any excess traces of thread locking compound from the threaded hole in the bottom of the piston.
- 11 Use a suitable screwdriver to lever the dust seal out of the slider, taking care not to damage the slider, remove the retaining ring and lever out the oil seal. If the seal is tight, pour boiling water over the slider upper end, taking care to prevent the risk of personal injury. Take care not to damage the slider.

- 12 Clean all components with a high flash-point solvent and dry them with compressed air.
- 13 Check the springs are not sagged, broken or otherwise damaged. On KLT110 A2 models the main spring free length is 226.2 mm (8.91 in) and the top spring free length is 90.1 mm (3.55 in); renew the springs if either has settled to a free length significantly shorter than this. Note that no specifications are available for the KLT160 model. If any spring has to be renewed, always renew all four springs to maintain suspension performance and stability.
- 14 Check the fork inner tube, the slider and the damper piston for score marks, scratches, and excessive or abnormal wear.
- 15 Replace the Teflon piston rings with new ones.
- 16 Have the fork tube checked for runout at an automotive machine shop. If it is bent, it should not be straightened. Replace it with a new one.
- 17 On assembly, press a new fork seal into the slider (with the open seal end facing down) and tap it into place until the retaining ring groove is exposed. Use a socket, which fits against the seal outer edge only, as a seal driver if the service tool part number 57001-1129 is not available. Refit the retaining ring, press the dust seal into place and smear fork oil over both seal lips.
- 18 With the rebound spring in place, slide the damper piston into the fork tube until it protrudes from the lower end. Slip the oil lock piece over the damper piston, then slide the entire fork tube assembly into the slider.
- 19 Mount the slider in the vise. Apply thread locking compound to the Allen head bolt, install the bolt through the slider and into the damper piston and tighten it to the specified torque.
- 20 Clamp the fork leg vertically in the vise and press the inner tube fully in. Pour in the specified amount of the correct grade of fork oil, then check the oil level (See Chapter 1).
- 21 Fit the main spring with its smaller diameter end downwards, followed by the spring seat and top spring. Press in the top plug, renewing its sealing O-ring if necessary, and seat the retaining ring in its groove. Install the boot.
- 22 Repeat the procedure on the remaining fork leg.
- 23 On installation, note that the right fork leg has the axle holder clamp. Insert the inner tube into the fork top assembly and refit the upper clamp bolt, ensuring that it engages correctly with the groove in the inner tube.
- 24 Tighten first the upper clamp bolts, then the lower clamp bolts, all to the specified torque settings. Pull up the boot as far as possible and tighten its clamp.

6 Front suspension – removal, inspection and installation – KLT200 C and KLT250 models

- 1 Remove the front wheel. See Chapter 6.
- 2 Remove the upper and lower mounting bolts, and withdraw the two shock absorbers.
- 3 Unscrew the retaining nuts, remove the two pivot bolts and withdraw the suspension arm.
- 4 Remove from each arm pivot bearing the two dust caps, then push out the inner sleeves. Remove its mounting bolt to release the stopper.
- 5 Wash all components with high flash-point solvent and dry them with compressed air.
- 6 Temporarily refit the pivot bolts to the inner sleeves and feel for free play. If any exists, or if either bearing surface is scored, grooved or otherwise worn or damaged the affected components must be renewed.
- 7 Similarly check the fit of the inner sleeves in the bushings, renewing either component if free play is felt, or if signs of wear or damage can be seen. In this case, the sleeve outside diameter and the bushing inner diameter can be measured (at several points, to check if there is any sign of ovality or other uneven wear). Subtract the sleeve measurement from that of the bushing to find the clearance; if this exceeds the service limit specified at any point, both bushings and sleeves must be renewed.
- 8 To remove and install the bushings use either a press or a version of the drawbolt arrangement shown in accompanying illustration.
- 9 The shock absorbers are sealed units; if either is leaking oil, or if it is damaged, or if the suspension action has deteriorated, it must be renewed. Always renew both units together to preserve the machine's stability and to ensure good suspension performance. Note that the

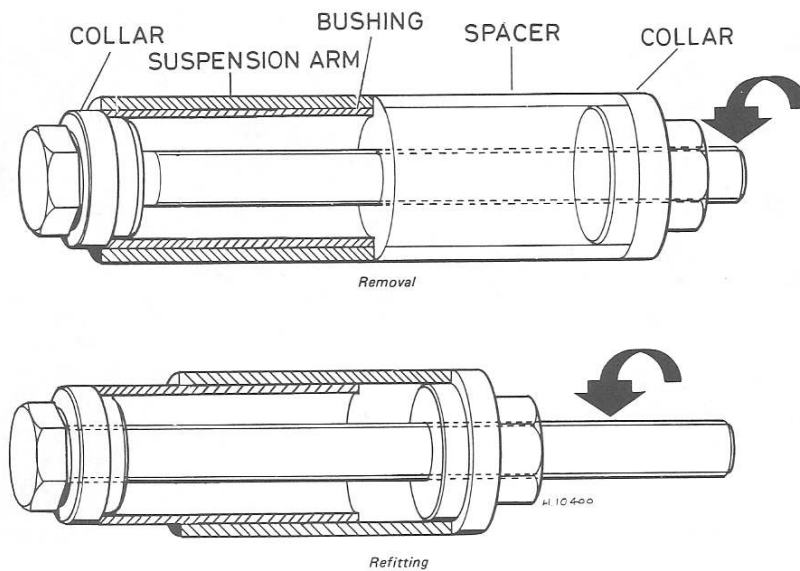


Fig. 5.4 Drawbolt tool for removing and installing suspension arm pivot bushings – KLT200 C and KLT250 (Sec 6)

mounting collars and dampers may be measured separately if worn or damaged.

10 On installation, reverse the removal procedure, noting the following points:

11 Do not apply grease to the bushings, only to the pivot bolts where they pass through the inner sleeves; the bushings are self-lubricating and the presence of grease will only attract dirt, thus causing rapid wear.

12 Assemble the front suspension, tightening only lightly the mounting bolts and nuts. When all components are refitted in their working positions, tighten the nuts and bolts to the specified torque settings.

7 Seat – removal and installation

KLT110 models

1 Pull the locking lever to the rear to release the seat, lift it at the rear and pull backwards to release it.

2 On installation, check that the rubber damper is in place on the seat

front mounting hook and ensure that the hook is engaged under the tank mounting. Press the seat down to lock it.

KLT160 models

3 Unhook the trunk cover retaining strap and pull the trunk cover to the rear to release it.

4 Pull the locking lever to the rear to release the seat, lift it at the rear and pull backwards to release it.

5 On installation, check that the rubber damper is in place on the seat front mounting hook and engage the hook under the tank mounting. Press the seat down to lock it and refit the trunk cover.

KLT200 models

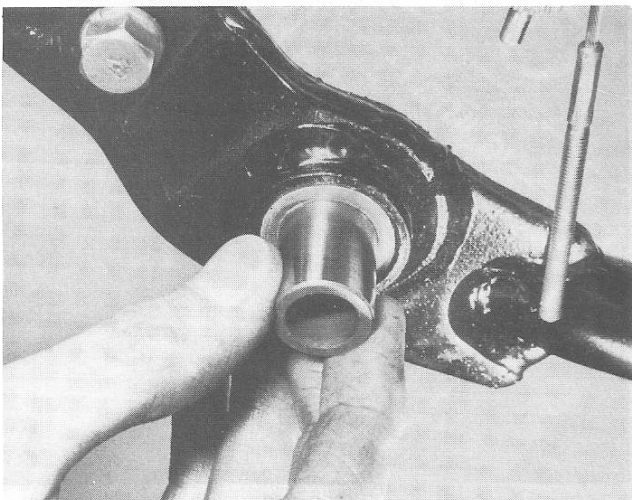
6 Press the locking lever forwards to release the seat, then lift it off.

7 Press the seat down to lock it on installation.

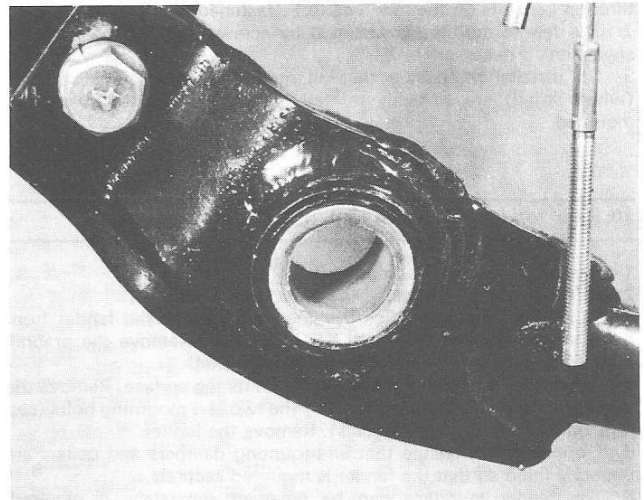
KLT250 models

8 Unscrew the two wing bolts, one on each side, lift the seat at the rear and pull backwards to release it.

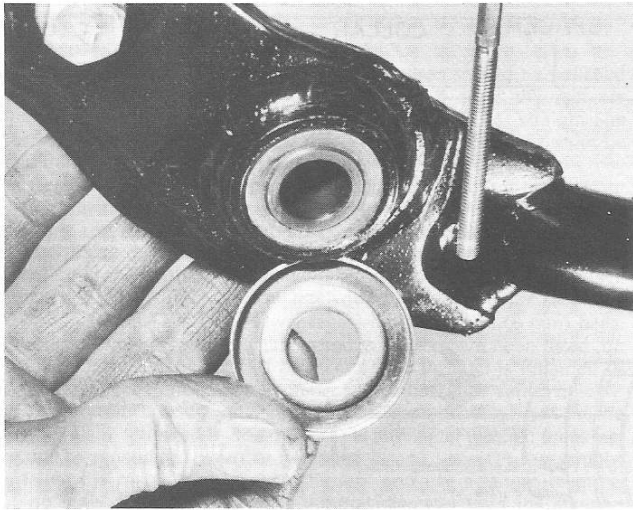
9 Engage the seat front mounting hook under the front cover brace on installation.



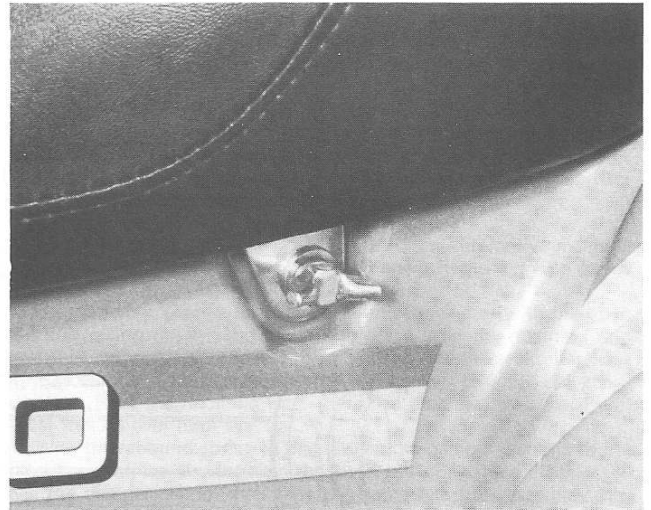
6.7 Feel for free play between inner sleeves and pivot bushings – renew any worn component



6.8 Bushings must be removed and installed using a press, or similar



6.11 Do not omit sealing caps on assembly – apply grease only to pivot bolts



7.8 Seat is retained by two wing bolts, one on each side – KLT250

8 Front cover – removal and installation – KLT200 and 250 models

- 1 Remove the seat. See Section 7.
- 2 Except KLT200 C models – Unscrew the ignition switch retaining ring, unscrew the two rear mounting bolts and withdraw the cover. Note the separate brace – KLT250 models only.
- 3 KLT200 C models – Remove the two rear mounting bolts, unhook the retaining strap and lift off the storage case cover, then remove the strap hook fastening screw and lift off the cover. Remove the two bolts in the bottom of the storage case, lift the case and disconnect the accessory plug wires. Remove the storage case.

9 Front fender – removal and installation

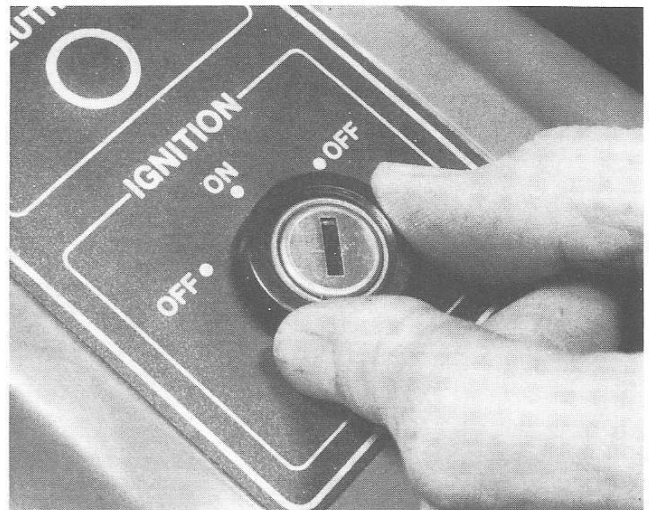
- 1 The fender is mounted to the fork assembly by four bolts on all models except the KLT200 A models, which have four bolts passing through brackets on the fork legs to be fastened by cap nuts.
- 2 The fender mudflap is fastened by screws and can be renewed separately, if necessary.
- 3 On installation, ensure that all mounting collars and dampers (where fitted) are correctly refitted so that the fender is securely mounted.

10 Rear fender – removal and installation

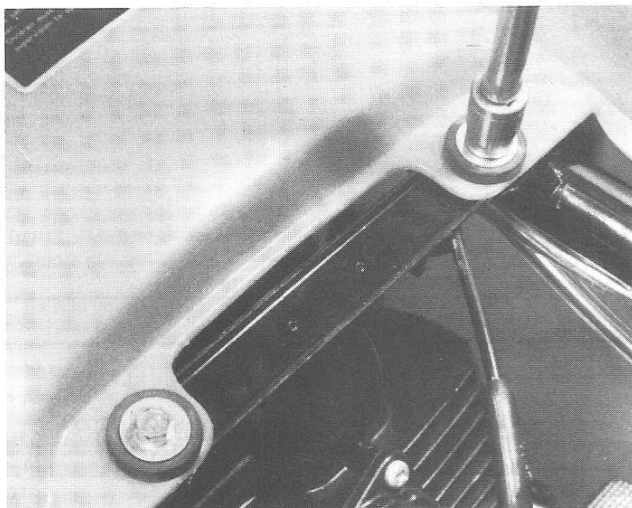
- 1 Remove the seat. See Section 7.
- 2 KLT250 models – Remove the trunk. See Section 11.
- 3 KLT250 P1 models – Remove the bolt holding the fender front edge to each footboard. All KLT250 models – Remove the grabrail mounting bolts to release the fender rear bracket.
- 4 The fender is retained at four points on its top surface. Remove the two front mounting bolts followed by the two rear mounting bolts (cap nuts on KLT200 B and C models). Remove the fender.
- 5 On installation ensure that all mounting dampers and collars are correctly fitted so that the fender is mounted securely.
- 6 The fender mudflaps can be renewed separately, if required. Remove the mounting screws, withdraw the stay and remove the mudflap. Do not forget to refit the stays on installation.

11 Trunk – removal and installation – KLT250 models

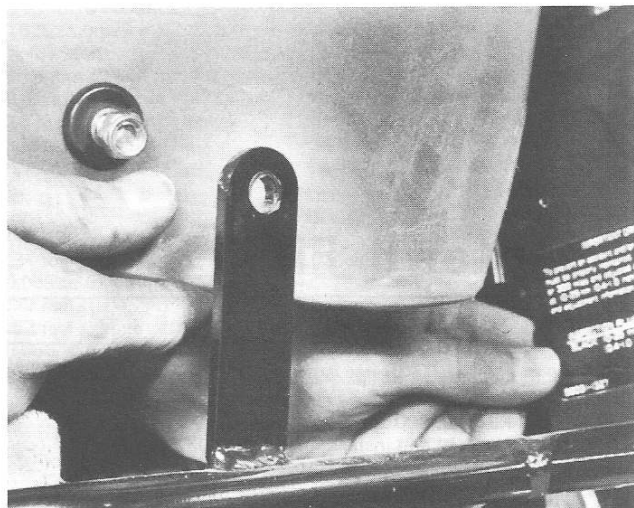
- 1 Open the trunk lid.
- 2 Unscrew the four mounting bolts and remove the two mounting plates, then lift away the trunk. Note the mounting collars and dampers inserted in the rear fender.
- 3 On installation, place the trunk on the rear fender so that the mounting holes align, then fit the mounting plates so that their rolled-up edges are on the outside. Tighten the bolts securely.
- 4 If it is necessary to renew the trunk lid lock or hinge, use a 4 mm (No. 22, $\frac{5}{32}$ in) drill bit to drill out the rivet heads. Be very careful not to let the drill slip and scratch the trunk. Insert the new rivets using a pop-rivet tool; do not forget to fit a back-up washer with every rivet to prevent them pulling through the trunk or lid.



8.2a Removing front cover KLT200, 250 – unscrew ignition switch retaining ring ...



8.2b ... and remove two rear mounting bolts to release cover



10.4 Removing rear fender KLT250 – do not forget to remove two lower front mounting bolts

12 Frame ancillary components – removal and installation

1 Depending on the model, various components are bolted to the main frame structure which might require removal during the course of other work or for repair.

2 Such components include the grabrail, footpeg or footboard assembly and front and rear carriers.

3 Before removal, look carefully at the assembly, noting its mounting points, and construction. Remove the main mounting bolts to withdraw the complete assembly; if required it can then be disassembled into its component parts.

4 On installation, ensure that all mounting cables and dampers (where fitted) are correctly installed, do not forget any plain or lock washers, and tighten the bolts securely when the assembly is correctly aligned on its mountings.

Chapter 6 Final drive

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Specifications

	KLT110	KLT160	KLT200 B and 250 A
Axle drive system	Chain, driving solid rear axle through damper	Shaft, driving rear axle through ring and bevel gears	Chain, driving solid rear axle
Bevel gear backlash			
Front	N/App	0.08 to 0.13 mm (0.003 to 0.005 in)	N/App
Final	N/App	0.08 to 0.11 mm (0.003 to 0.004 in)	N/App
Sprocket			
Minimum warp	N/Av	N/App	0.6 mm (0.023 in)
Diameter	198.81 to 194.31 mm (7.83 to 7.65 in)	N/App	243.22 to 242.77 mm (9.575 to 9.557 in)
Service limit	193.5 mm (7.62 in)	N/App	241.8 mm (9.519 in)
Chain			
Length (over 20 links)	254.0 to 254.8 mm (10.0 to 10.031 in)	N/App	317.5 to 318.1 mm (12.50 to 12.523 in)
Service limit	260 mm (10.236 in)	N/App	323.0 mm (12.716 in)
Slack	10 to 25 mm (0.4 to 1.0 in)	N/App	10 to 25 mm (0.4 to 1.0 in)
Axle drive system	KLT200 A Chain, driving rear axle differential (type 1)		KLT200 C and 250 C/P Chain, driving rear axle differential (type 2)
Axle			
Maximum runout	0.3 mm (0.12 in)		0.12 mm (0.005 in)
Side play	0.5 to 4.5 mm (0.02 to 0.17 in)		N/App
Diameter	25.32 to 25.37 mm (0.996 to 0.999 in)		21.95 to 21.98 mm (0.864 to 0.865 in)
Service limit	25.20 mm (0.992 in)		21.80 mm (0.858 in)
Bush inside diameter	25.46 to 25.50 mm (1.002 to 1.004 in)		22.0 to 22.021 mm (0.866 to 0.867 in)
Service limit	25.70 mm (1.012 in)		22.22 mm (0.875 in)

Differential pinion		KLT200 A	KLT200 C and 250 C/P			
Inside diameter		15.88 to 15.96 mm (0.625 to 0.628 in) – spider only	16.0 to 16.018 mm (0.630 to 0.631 in)			
Service limit		16.16 mm (0.636 in)	16.118 mm (0.634 in)			
Shaft diameter		15.82 to 15.85 mm (0.623 to 0.624 in) – at spider contact	15.996 to 15.984 mm (0.628 to 0.629 in)			
Service limit		15.70 mm (0.618 in)	15.86 mm (0.624 in)			
Thrust washer thicknesses						
Spider pinion		1.34 to 1.57 mm (0.053 to 0.062 in)	N/App			
Service limit		1.22 mm (0.048 in)	N/App			
Differential		1.52 to 1.60 mm (0.060 to 0.063 in)	1.95 to 2.05 mm (0.076 to 0.080 in)			
Service limit		1.4 mm (0.055 in)	1.8 mm (0.071 in)			
Differential casing thrust surface						
Maximum wear		N/App	0.2 mm (0.008 in)			
Sprocket		KLT200 A/C and 250 C/P				
Minimum warp		0.6 mm (0.023 in)				
Diameter		243.22 to 242.77 mm (9.575 to 9.557 in)				
Service limit		241.8 mm (9.519 in)				
Chain						
Length (over 20 links)		317.5 to 31.18 mm (12.50 to 12.523 in)				
Service limit		323.0 mm (12.716 in)				
Slack		10 to 25 mm (0.4 to 1.0 in)				
Guard minimum thickness (except KLT200 A)		1.0 mm (0.04 in)				
Torque wrench settings – kgf m (lbf ft)		KLT110	KLT160	KLT200 B and 250 A	KLT200 A	KLT200 C and 250 C/P
Component						
Axle mounting bolts		6.0 (43.0)	5.5 (40.0)	3.0 (22.0)	3.0 (22.0)	3.0 (22.0)
Sprocket retaining nuts		3.0 (22.0)	N/App	2.4 (18.0)	2.4 (18.0)	6.0 (43.0)
Brake drum retaining nuts		8.0 (58.0)	8.5 (61.0)	2.4 (18.0)	2.4 (18.0)	6.0 (43.0)
Axle end nuts		9.0 (65.0)	15.0 (110.0)	11.5 (83.0)	11.5 (83.0)	13.5 (100.0)
Gear case:						
Through bolts		N/App	N/App	N/App	3.0 (22.0)	6.0 (43.0)
Mounting bolts		N/App	3.0 (22.0)	N/App	N/App	N/App
Cover retaining nuts		N/App	10.0 (72.0)	N/App	N/App	N/App
Cover bolts		N/App	1.0 (7.2)	N/App	N/App	N/App
Cover bearing retainer bolts		N/App	1.0 (7.2)	N/App	N/App	N/App
Oil drain and filler plug(s)		N/App	3.0 (22.0)	N/App	N/App	5.5 (40.0)
Oil level bolt		N/App	1.0 (7.2)	N/App	N/App	N/App
Pinion gear:						
Shaft bolt		N/App	N/App	N/App	N/App	4.5 (32.0)
Casing nuts		N/App	1.0 (7.2)	N/App	N/App	N/App
Retaining nut		N/App	8.0 (58.0)	N/App	N/App	N/App
Bearing holder		N/App	8.0 (58.0)	N/App	N/App	N/App
Chain tensioner roller bolt		N/App	N/App	1.8 (13.0)	N/Av	1.8 (13.0)

1 General information

As will be evident from the Specifications Section of this Chapter, several different types of final drive are fitted.

KLT110, 200 B and 250 A models are fitted with a solid (ie, one-piece) rear axle driven by a roller chain and sprocket. The KLT110 model is fitted with a damper assembly in the rear sprocket mounting to minimise transmission shock loads. KLT200 A models are fitted with a two-piece axle; a chain and sprockets transmit the drive to a differential assembly that can be locked or unlocked as required. KLT200 C and 250 C and P models are also fitted with a two-piece axle, but in this case the chain and sprockets drive a second type of lockable differential. All models are fitted with fully-enclosed chains which will greatly increase chain life. Never run the machine with any part of the enclosure removed or damaged.

KLT160 models are fitted with a solid (ie, one-piece) axle, which is driven by a propeller shaft. The drive is transmitted via bevel gear sets at the shaft front and rear ends, and a universal joint is fitted in the shaft to compensate for any slight differences in alignment between the engine and rear axle assemblies.

2 Drive chain case and tensioner – removal, inspection and installation – KLT110, 200 and 250 models

KLT110 models

- 1 Remove the air cleaner. See Chapter 3.
- 2 Remove the three retaining screws and withdraw the front outer chain cover.
- 3 Slide the rubber cover around the rear axle to the left.

- 4 Remove the six bolts and nuts then withdraw the upper chain case, pulling it upwards and to the rear.
- 5 Remove the four mounting bolts and lower away the chain case guard from under the machine.
- 6 Withdraw the lower chain case. Wash all components thoroughly with a high flash-point solvent.
- 7 Check the chain cases for wear or damage and renew them if necessary.
- 8 Installation is the reverse of the removal procedure. Check that the double welded nuts are in position on the mounting bracket. Do not tighten any of the chain case mounting bolts or screws until all components are installed and all bolts and screws started in their threads.

KLT200 and 250 models

- 9 Remove the seat, rear carrier or trunk (where fitted) and the rear fender. See Chapter 5.
- 10 Remove the muffler. See Chapter 3.
- 11 Remove the left rear wheel. See Chapter 7.
- 12 Remove its mounting bolts and withdraw the chain case guard from under the machine.
- 13 Remove the chain tensioner assembly. Use a felt marker to mark the

position of the lever on the tensioner arm so that it can be refitted in the same position, unscrew the two lever bracket bolts, remove the bolt (or nut, KLT200 A) securing the bracket to the arm and withdraw the bracket. Remove the lever pinch bolt and pull the lever off the arm splines. Unscrew the adjusting knob, then withdraw the lever and rod, taking care not to lose the spring and washer from the rod. If it is necessary to remove the adjuster bracket from the frame to provide clearance for the chain case to be removed, unscrew the two bolts and withdraw the bracket.

14 Remove the rear brake adjuster. Unscrew the adjusting nut and disconnect the rod front end by straightening and pulling out the cotter pin, then removing the clevis pin. Remove the brake rod, taking care not to lose the spring and pin from the rod. **Note:** on KLT200 A models to remove the outer chain case it may be necessary to remove the brake pedal, unscrewing the retaining cap nut and noting the alignment marks between pedal and shaft; to pull the shaft out to the left, and to remove the pedal return spring bracket which is retained by two bolts. Check that the pedal assembly does not prevent outer chain case removal and withdraw it if necessary.

15 Except KLT200 A models – Remove the three screws and two bolts, then remove the front outer chain cover.

16 Remove all eight bolts and lock washers from the chain case left rear

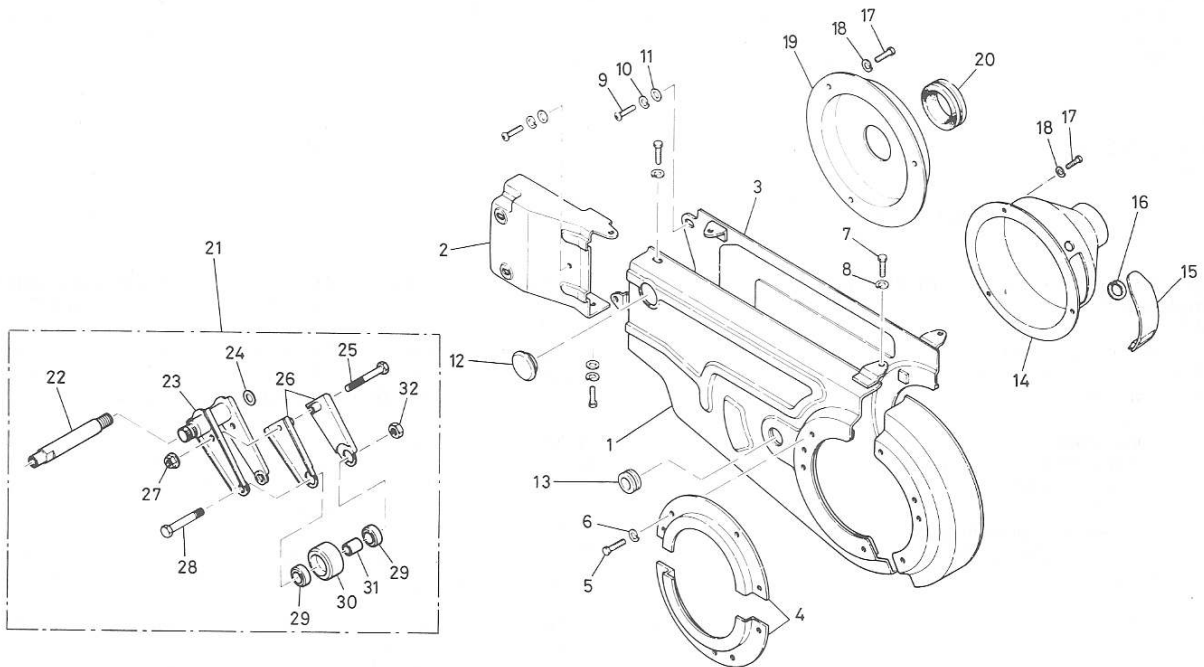


Fig. 6.1 Chain case assembly – KLT200 and 250 (Sec 2)

- | | | | |
|----------------------------|-------------------------|-----------------------------|-------------------------------|
| 1 Chain case | 9 Screw | 17 Bolt | 25 Bolt |
| 2 Front chain case section | 10 Spring washer | 18 Spring washer | 26 Guide plate – where fitted |
| 3 Inner chain case | 11 Washer | 19 Differential cover □ | 27 Nut |
| 4 Brackets | 12 Inspection plug | 20 Seal □ | 28 Bolt |
| 5 Bolt | 13 Grommet | 21 Chain tensioner assembly | 29 Bearing |
| 6 Spring washer | 14 Differential cover △ | 22 Pivot shaft | 30 Roller |
| 7 Bolt | 15 Inspection cover △ | 23 Tensioner arm | 31 Collar |
| 8 Spring washer | 16 Circlip △ | 24 Washer | 32 Nut |

Note: on KLT200 A1, A2 and A3 models items 1 and 2 are a one piece unit

△ KLT200 A, C, 250 C and P models only

□ KLT200 B and 250 A models only

side, then withdraw the two chain cover plates from around the rear axle. From the right rear side of the chain case, remove three bolts and slide the differential/chain cover along the axle to the right. Unscrew any remaining bolts securing it and withdraw the rear chain cover.

17 Remove the outer chain case. KLT250 A1 models – Remove the two front mounting screws and the four mounting bolts. All other models – Remove the three or four bolts from around the case. Pull the case out at the front, work it over the chain tensioner arm shaft, then lift it at the front and work it clear of the machine without scratching it.

18 Disconnect or remove the drive chain. See Section 3. Where an endless chain is fitted, remove the tensioner roller bolt and withdraw the roller to allow the chain to be separated from it.

19 Pull the tensioner arm off its pivot, then unscrew the pivot. Note the flat washer fitted to the pivot end to prevent damage to the inner chain case (except KLT200 A); do not forget the washer on installation.

20 Remove the two front mounting screws and carefully work the inner chain case clear of the machine without bending it.

21 Thoroughly clean all components in a high flash-point solvent and dry them. Check each item for obvious signs of wear or damage and renew them where necessary.

22 Check that the chain tensioner roller rotates easily, renewing the

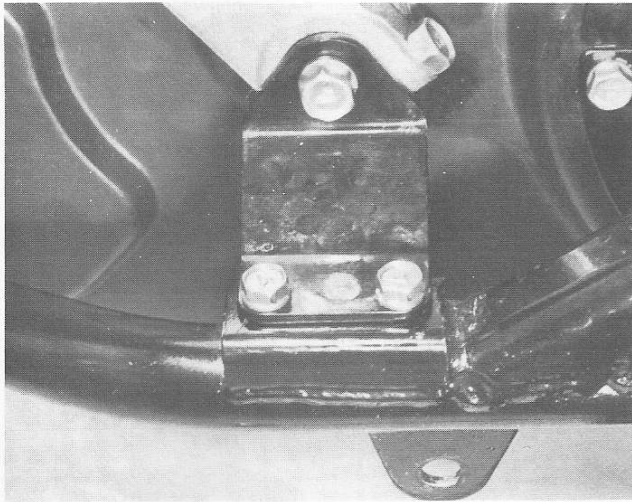
bearings if any roughness or binding is felt. Renew the roller itself if it is cracked, chipped or excessively worn. Where nylon guard blades are fitted inside the tensioner arm measure their thickness at the point where the chain rubs against them; if either is worn to a thickness of 1 mm (0.04 in) or less, both must be renewed.

23 Installation is the reverse of removal, noting the following points:

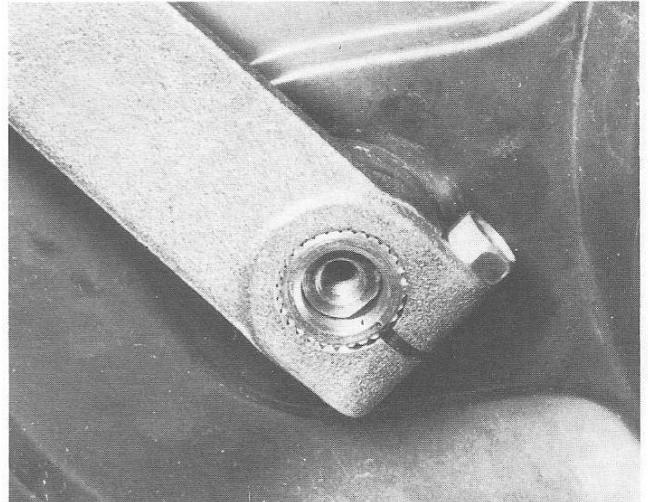
24 On fitting the inner chain case, place it in position and screw in the tensioner pivot and two front mounting screws. Apply thread locking compound to the pivot thread and tighten it (do not forget the flat washer, where fitted) to the specified torque setting, then tighten securely the two screws. Smear grease over the pivot before refitting the tensioner arm.

25 Fit all the chain case sections, starting the mounting bolts and screws on their threads, but do not tighten the mountings until all components are correctly installed. When this is the case, tighten the bolts and screws securely, but do not overtighten them or the case may be distorted.

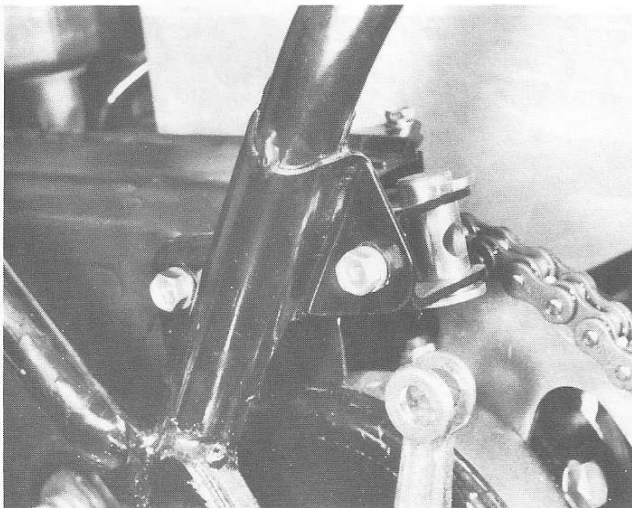
26 Lubricate with grease or oil (see Chapter 1) all components of the chain tensioner and rear brake assemblies as they are refitted. Do not forget to adjust the chain tension and rear brake before using the machine.



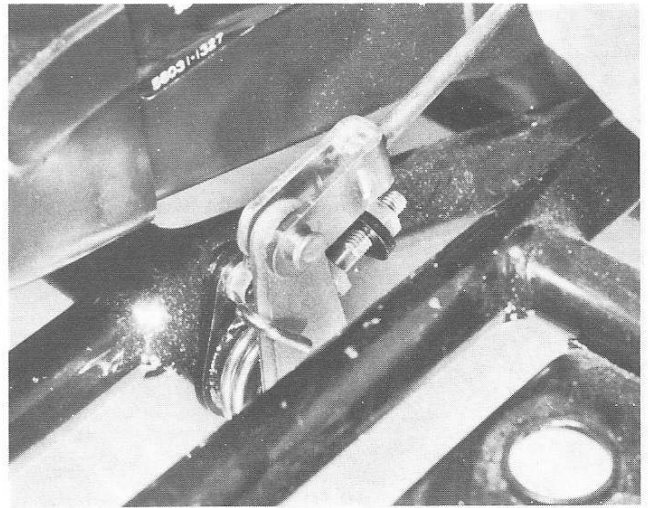
2.13a Remove chain tensioner lever bracket mounting bolts and withdraw bracket



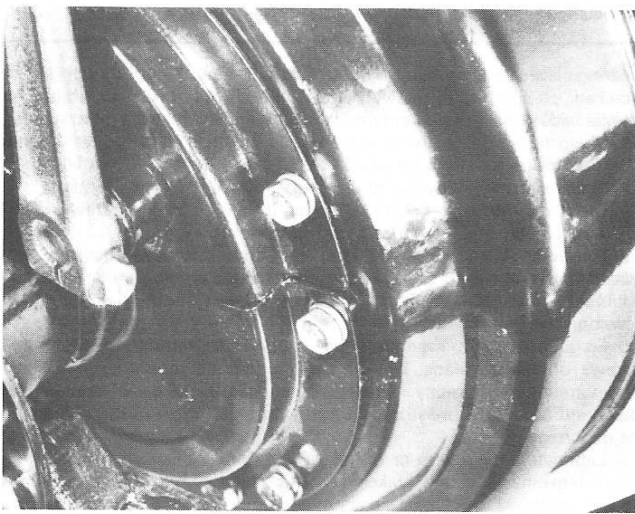
2.13b Note punch mark on tensioner arm shaft to ensure that lever can be correctly refitted – if no punch mark is found, shaft should be marked before removing lever



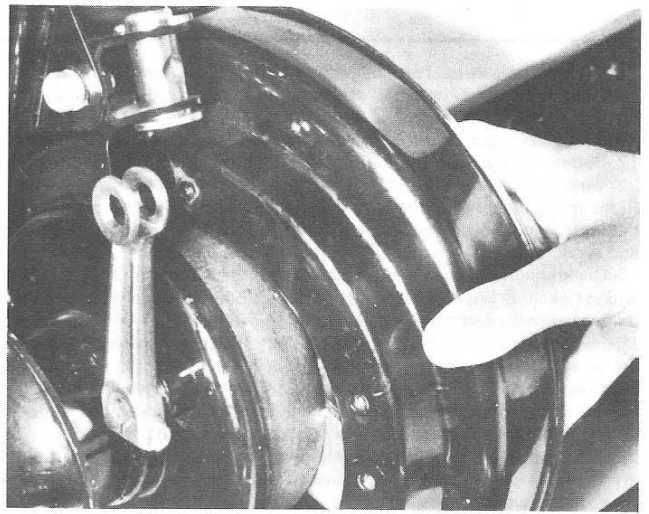
2.13c Remove adjuster knob and rod – it may be necessary to remove adjuster bracket for clearance



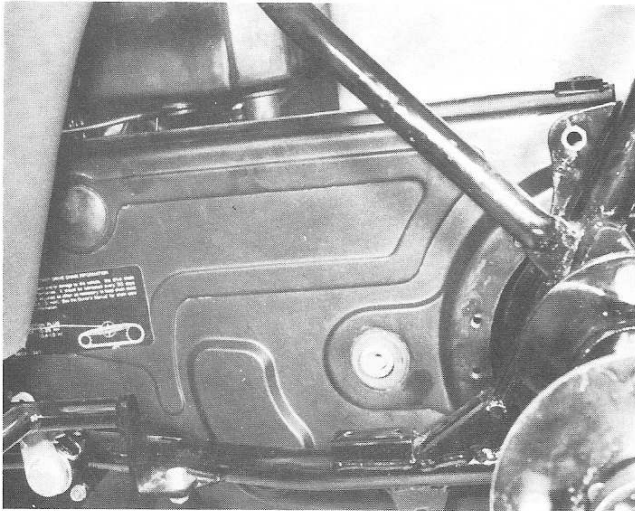
2.14 Disconnect brake rod at pedal shaft – it may be necessary to remove pedal and shaft assembly



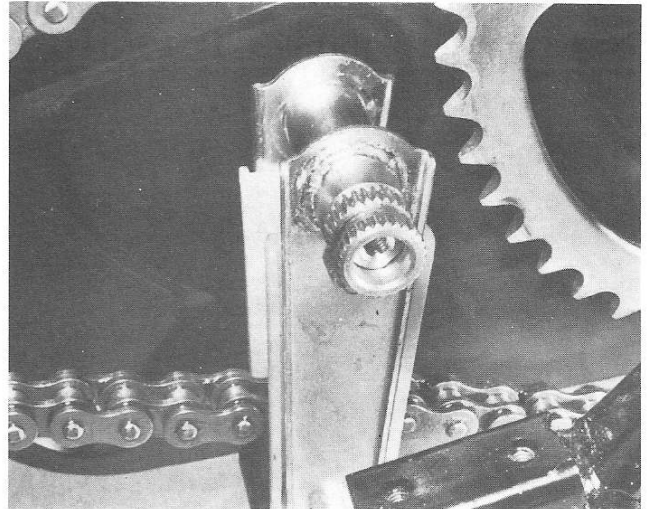
2.16a Remove all bolts and withdraw two chain cover plates ...



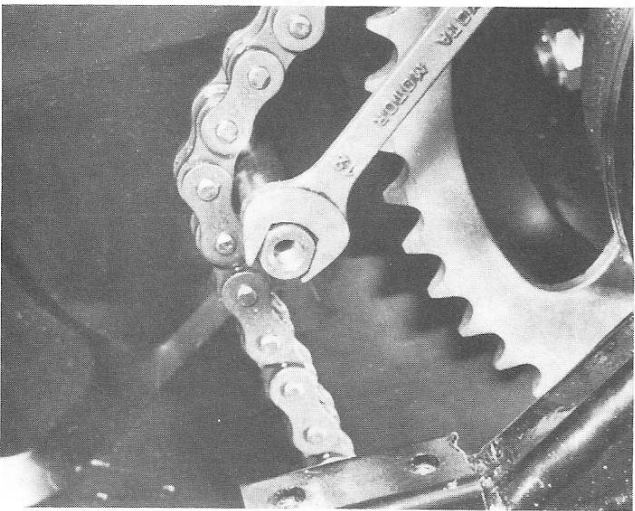
2.16b ... then remove chain rear cover



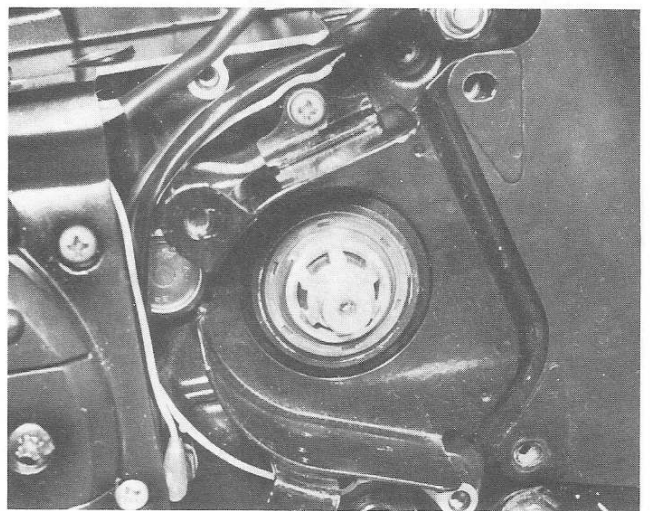
2.17 Be careful not to scratch or distort outer chain case as it is removed



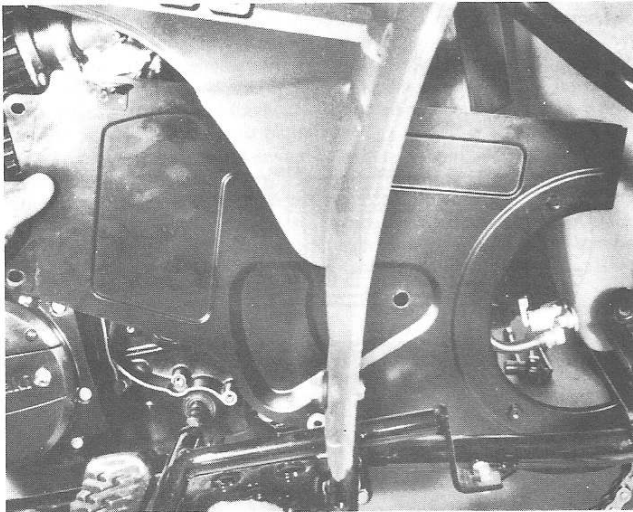
2.18 Remove roller to disengage tensioner arm from drive chain



2.19 Remove tensioner arm and unscrew pivot



2.20a Unscrew two front mounting screws ...



2.20b ... and withdraw inner chain case – do not scratch or bend it

3 Drive chain – removal and installation – KLT110, 200 and 250 models

Note: the instructions given below for KLT110 and later KLT200, 250 models are based on the assumption that the standard OE endless chain is fitted to the machine being serviced. If a chain has been fitted that has a master link, the procedure given for early KLT200 and 250 models can be adopted to speed up the work.

KLT110 models

- 1 Remove the chain case components and the chain case guard. See Section 2.
- 2 Remove the left rear wheel. See Chapter 7.
- 3 Remove the gearbox sprocket. See Section 5.
- 4 Disengage the chain from the rear sprocket and remove it.
- 5 Reverse the removal procedure to install the chain.

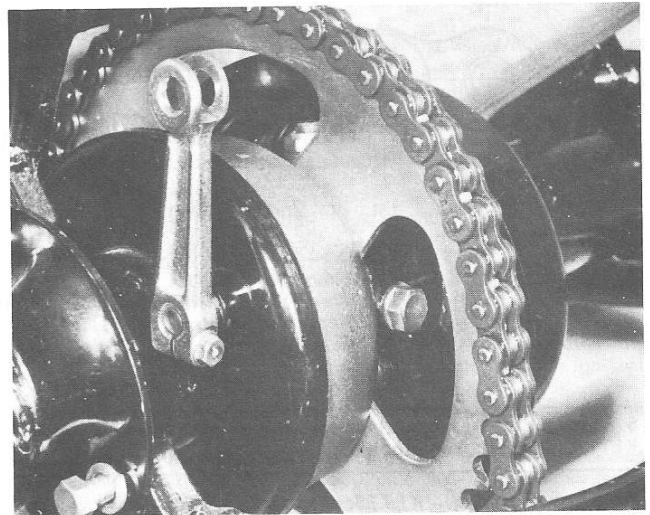
KLT200 A1, A2, A3 and KLT250 A1 models

- 6 Obtain a worn out chain of the same length and size as that fitted to the machine (perhaps from a dealer's trash bin).
- 7 Lift the rear of the machine on to a stand so that the wheels are clear of the ground.
- 8 Remove from the left and right rear sides of the chain case the bolts securing the rear chain case; there should be approximately seven bolts. Withdraw the rear chain case and rotate the rear wheels until the chain master link appears in the opening. Prevent the wheels from rotating by applying the rear brake or by blocking the wheels.
- 9 Remove the spring clip and sideplate from the master link. Hold the chain on the sprocket and remove the master link. Tie a length of string to the chain lower end, then use the master link to connect the worn out chain to the chain upper end.
- 10 Pull on the string while feeding the worn out chain into the chain case; the worn out chain will then pass around the sprockets, through the chain tensioner and out of the chain case. Tie the worn out chain ends to the frame so that they cannot drop back inside the chain case, then disconnect the original chain and withdraw it.
- 11 On installation reverse the removal procedure to draw the original chain around the sprockets. Disconnect the worn out chain and refit the master link to connect the original one. Note that the master link spring clip closed end must always be refitted in the direction of chain travel.
- 12 Refit the rear chain case, lower the machine and check the chain adjustment.

13 **Note:** if an endless chain is fitted to these models, or if the chain is allowed to drop into the chain case and cannot be extracted during the execution of the above procedure, the chain case must be removed as described below.

KLT200 A4, A4A, B1, C, KLT250 A2, C and P models

- 14 Remove the outer chain case and remove the roller from the chain tensioner. See Section 2, paragraphs 9 – 18.
- 15 Remove the gearbox sprocket. See Section 5.
- 16 Remove the rear axle. See Section 6. Disengage the chain from the sprocket and remove it.
- 17 Installation is the reverse of the removal procedure. Check the chain and rear brake adjustment before using the machine.



3.1 If endless chain is fitted, rear axle must be removed to allow chain withdrawal

4 Drive chain – inspection and maintenance – KLT110, 200 and 250 models

Note: refer to Chapter 1 for details of chain adjustment and lubrication.

- 1 Remove the chain from the vehicle. See Section 3.
- 2 Wash the chain in a bath of high flash-point solvent, swilling it around to ensure that all dirt and old lubricant is removed. Dry the chain carefully with compressed air.
- 3 Examine the chain for obvious wear or damage. If any links are stiff or very sloppy, if there is any sign of kinking or twisting, or if there are any signs of damage such as split sideplates or cracked or missing rollers, the chain should be renewed as a matter of course. Where an O-ring chain is fitted check that all the O-rings are in place and in good condition.
- 4 To measure chain wear anchor one end and pull on the other with a force of at least 10 kg (22 lbs). Mark any one pin, count off 21 pins and measure the distance between the two, ie a 20 link length. Since chains do not wear evenly, repeat this test at points all along the chain's length. If any measurement exceeds the service limit, the chain must be renewed.
- 5 Before refitting the chain, lubricate it thoroughly using the specified lubricant (see Chapter 1) or by using a commercial chain lubricant. Non O-ring type chains are best immersed in a bath of lubricant and swilled around to ensure that the lubricant penetrates the bearings.
- 6 Refit the chain to the machine, but note that if the chain has been renewed, the sprockets should be renewed as well.

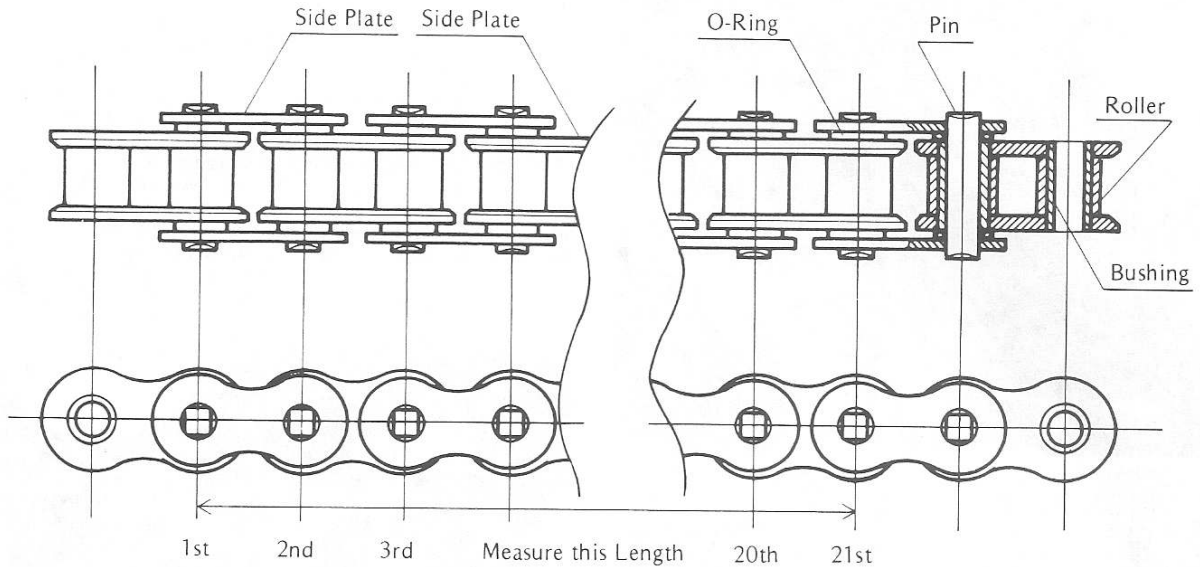


Fig. 6.2 Drive chain wear check (Sec 4)

5 Sprockets – removal, inspection and installation – KLT110, 200 and 250 models

Gearbox sprocket – KLT110 models

- 1 Remove the front outer chain cover. See Section 2.
- 2 Remove the circlip, pull off the sprocket and disengage it from the chain. Tie the chain to prevent it falling into the chain case.
- 3 Note the output shaft collar and O-ring behind the sprocket. If these are disturbed, the O-ring must be renewed as a matter of course and the collar must be refitted with its bevelled side towards the engine.
- 4 On installation, renew the circlip if it is weakened or damaged, and fit the sprocket with its marked surface outwards.

Gearbox sprocket – KLT200 and 250 models

- 5 KLT200 A1 models – Remove the outer chain case. See Section 2, paragraphs 9 – 17.
- 6 All other models – Remove the front outer chain cover. See Section 2, paragraph 15.
- 7 Flatten back the raised tab of the lock washer, apply the rear brake to prevent rotation and unscrew the retaining nut.
- 8 Remove the toothed washer, slide the sprocket off the shaft and disengage it from the chain. Tie the chain to prevent it falling into the chain case (except KLT200 A1).
- 9 On installation, fit the sprocket with its shouldered side against the engine, then fit the lock washer so that its tooth engages in the sprocket hole. Tighten the nut to the specified torque setting and bend an unused portion of the lock washer up against one of the flats of the nut to secure it.

Rear sprocket – KLT110 models

- 10 Remove the cotter pin, apply the rear brake and slacken the left rear hub nut. Lift the machine on to a stand so that the wheel is clear of the ground.
- 11 Remove the nut and washer then slide off the wheel and hub together, followed by the chain case rubber cover.
- 12 Remove the drive chain. See Section 3.
- 13 Flatten back the raised tabs of the two lock washers, remove the four retaining nuts and the lock washers, then remove the sprocket.
- 14 Remove the four bolts and nuts securing the damper cases on each

side of the sprocket, pry off the cases, withdraw the rubber ring and press the dampers out of the sprocket.

15 Installation is the reverse of the removal procedure. Lubricate the dampers with soapy water or a similar rubber lubricant if they are new and a tight fit.

16 Note that the lock washers can be used only twice and must then be renewed. Never re-use a tab washer that has been installed and removed before. Tighten the sprocket retaining nuts in a diagonal sequence to the specified torque setting, then secure each nut by bending up an unused lock tab against one of its flats.

17 Grease the axle splines on refitting the wheel/hub assembly, tighten the nut to the specified torque setting and fit a new cotter pin to retain it.

Rear sprocket – KLT200 A models

- 18 Remove the cotter pin (where fitted), apply the rear brake and slacken the left rear hub nut.
- 19 Referring to Section 6, remove the rear axle.
- 20 Referring to Section 9, remove the nut, the hub, the left axle housing, the brake drum and the sprocket.
- 21 Reverse the removal procedure on installation.

Rear sprocket – KLT200 B and KLT250 A models

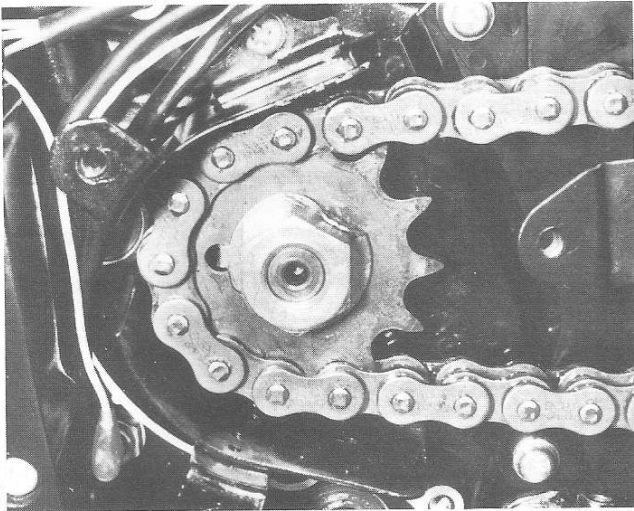
- 22 Remove the cotter pin, apply the rear brake and slacken the left rear hub nut.
- 23 Remove the rear axle. See Section 6.
- 24 Referring to Section 8, remove the nut, the outer washer, the hub, the inner washer, the bearing housing/brake panel and the spring. Then remove the brake drum and sprocket.
- 25 Reverse the removal procedure on installation.

Rear sprocket – KLT200 C, KLT250 C and P models

- 26 Remove the differential shifter. See Section 11.
- 27 Apply the rear brake and slacken the left rear hub nut.
- 28 Remove the rear axle. See Section 6.
- 29 Referring to Section 10, remove the nut, the hub and the bearing housing/brake panel. Then remove the brake drum and sprocket.
- 30 Reverse the removal procedure on installation.

Sprockets – inspection

- 31 Check the sprocket teeth for excessive wear (see accompanying illustration) or for chipped or missing teeth.
- 32 Where measurements are given (see Specifications) check the sprocket for excessive runout when installed and measure its outside diameter (at the base of the teeth). If either sprocket is damaged, warped or excessively worn it must be renewed.
- 33 To prevent the excessive wear caused by running new and part-worn components together, always renew the chain and sprockets together, regardless of the condition of the other components.
- 34 KLT110 models – Check the dampers and rubber ring for cracks, chips or other signs of damage or of excessive wear. Renew the dampers as a set if any one appears weak or damaged, also the ring.



5.9 Ensure lock washer is correctly fitted as shown to prevent retaining nut from slackening

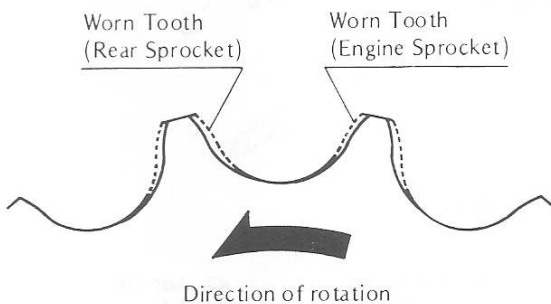


Fig. 6.3 Sprocket tooth wear check (Sec 5)

6 Rear axle – removal and installation – KLT110, 200 and 250 models

KLT110 models

- 1 Remove the cotter pins, apply the rear brake and slacken both rear hub nuts.

- 2 Lift the rear of the machine on to a stand so that the wheels are clear of the ground.
- 3 Remove the hub nuts and washers and pull off both wheel/hub assemblies.
- 4 Remove the drive chain. See Section 3.
- 5 If the brake drum is to be removed, unscrew the four bolts and slide off the drum cover, then apply the rear brake and slacken the two drum retaining nuts.
- 6 Unscrew the brake adjusting nuts and pull out each cable taking care not to lose the joints, washers and springs.
- 7 Remove the four axle mounting bolts and lift out the axle.
- 8 Installation is the reverse of the removal procedure, noting the following points. Install the axle with the brake cam in the 2 o'clock position.
- 9 Connect the rear brake pedal cable to the lower catch of the brake camshaft lever and the parking brake lever cable to the upper catch. Apply the brake and tighten the drum mounting nuts securely. If the equipment is available, tighten the nuts to the specified torque setting, following an adapted version of the procedure described in Section 13. Refit the drum cover.
- 10 Grease the axle splines before refitting the wheel/hub assemblies, install the washers and nuts, then apply the rear brake and tighten the nuts to the specified torque setting. Fit new cotter pins to secure the nuts.
- 11 Adjust the rear brake. See Chapter 1.
- 12 Adjust the chain tension. See Chapter 1.

KLT200 A1, A2, A3 and KLT250 A1 models

- 13 If the axle is to be disassembled, remove the cotter pins (where fitted), apply the rear brake and slacken the hub nuts.
- 14 Disconnect the drive chain. See Section 3.
- 15 Removing the remaining bolts, remove the left rear side of the chain case the two chain cover plates and from the right rear side the chain cover. See Section 2.
- 16 Unscrew the brake adjusting nut and disengage the rod from the brake lever taking care not to lose the spring and pin from the rod.
- 17 Remove the six axle mounting bolts (three on each bearing housing) and lift out the axle assembly. KLT200 A models – Note the locations of any shims between the axle and frame.
- 18 On installation, reverse the removal procedure, noting the following points. Install the axle with the brake cam in the 2 o'clock position.
- 19 KLT200 A models – Be careful to install the shims (if any) in exactly the same position from which they were removed. If the rear axle housings or the frame have been renewed, or if the original shim positions were lost, proceed as follows.
- 20 Temporarily mount the axle in the frame, but do not tighten the mounting bolts. Remove one rear hub and check that the axle is exactly centered in the housing. If not add shims between the housing flange and frame until the axle is centered. Repeat for the other housing.
- 21 All models – Tighten the mounting bolts to the specified torque setting.
- 22 Do not forget to adjust the rear brake and chain tension before using the machine. See Chapter 1.

All other KLT200 and 250 models

- 23 If the axle is to be disassembled, remove the cotter pins (where fitted) apply the rear brake and slacken the hub nuts. On KLT200 C, 250 C and P models refer to Section 10, paras 1 – 3.
- 24 Unscrew the brake adjusting nut and disengage the rod from the brake lever taking care not to lose the spring and pin from the rod.
- 25 Remove the drive chain. See Section 3. KLT200 C, 250 C and P models – Drain the final gear case oil. See Chapter 1.
- 26 Unscrew the six axle mounting bolts (three on each bearing housing) and lift out the axle assembly.
- 27 On installation reverse the removal procedure noting the following points. Install the axle with the chain engaged on the sprocket and the brake cam in the 2 o'clock position. Tighten the mounting bolts to the specified torque setting.
- 28 Do not forget to adjust the rear brake and chain tension before using the machine. See Chapter 1.
- 29 Where applicable, check the final gear case oil level and top up if necessary. See Chapter 1.

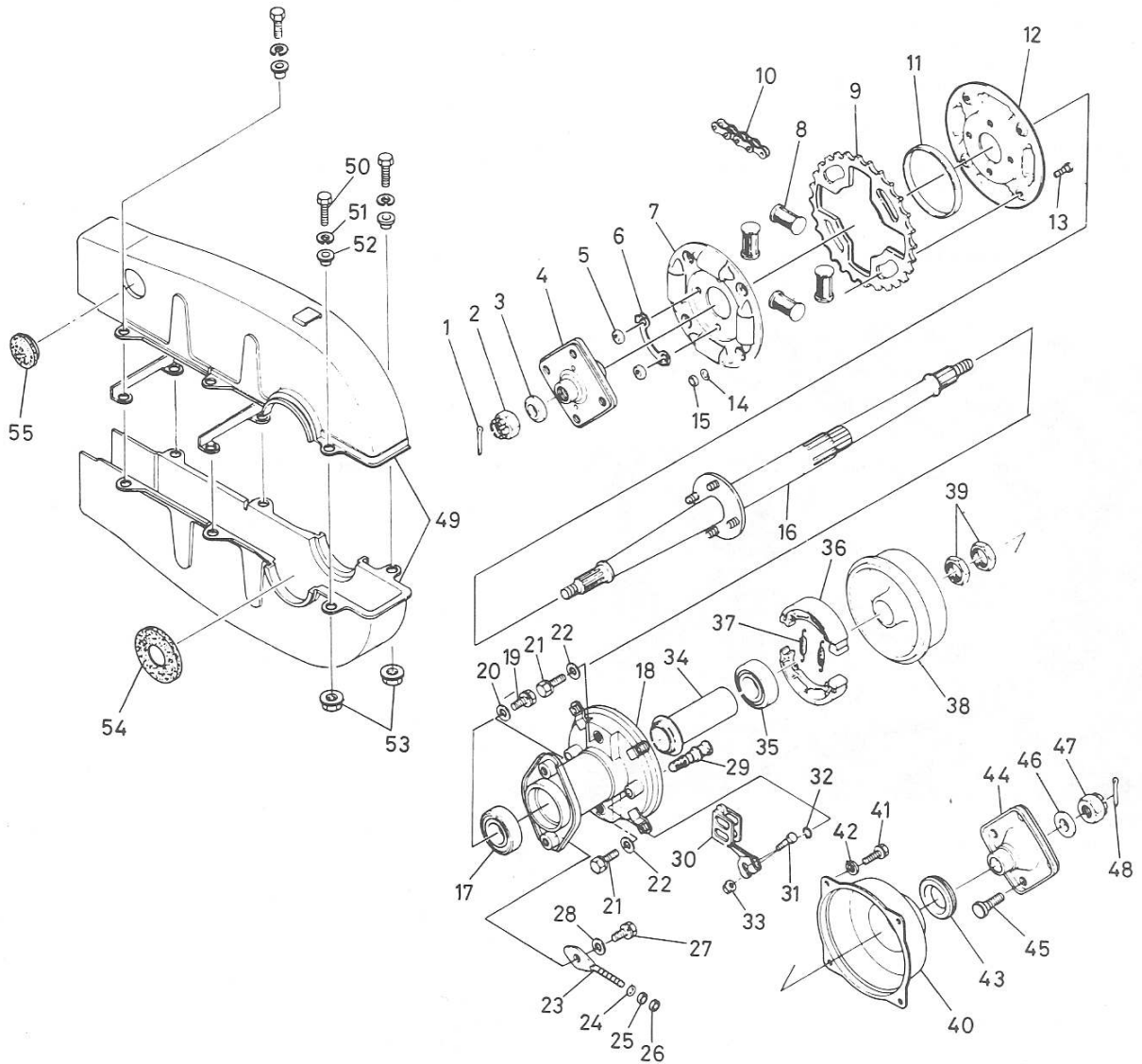


Fig. 6.4 Final drive – KLT110 (Sec 6)

- | | | | |
|------------------|--------------------------------|--------------------------|--------------------|
| 1 Cotter pin | 15 Nut | 29 Brake cam | 43 Dust seal |
| 2 Nut | 16 Axle | 30 Brake operating lever | 44 Hub |
| 3 Washer | 17 Bearing | 31 Bolt | 45 Stud |
| 4 Hub | 18 Bearing housing/brake panel | 32 Washer | 46 Washer |
| 5 Nut | 19 Bolt | 33 Nut | 47 Nut |
| 6 Tab washer | 20 Spring washer | 34 Spacer tube | 48 Cotter pin |
| 7 Damper case | 21 Bolt | 35 Bearing | 49 Chain case |
| 8 Dampers | 22 Spring washer | 36 Brake shoes | 50 Bolt |
| 9 Sprocket | 23 Chain adjuster | 37 Return springs | 51 Spring washer |
| 10 Chain | 24 Flat washer | 38 Brake drum | 52 Collar |
| 11 Rubber ring | 25 Nut | 39 Nuts | 53 Nut |
| 12 Damper case | 26 Locknut | 40 Brake drum cover | 54 Rubber cover |
| 13 Bolt | 27 Bolt | 41 Bolt | 55 Inspection plug |
| 14 Spring washer | 28 Washer | 42 Spring washer | |

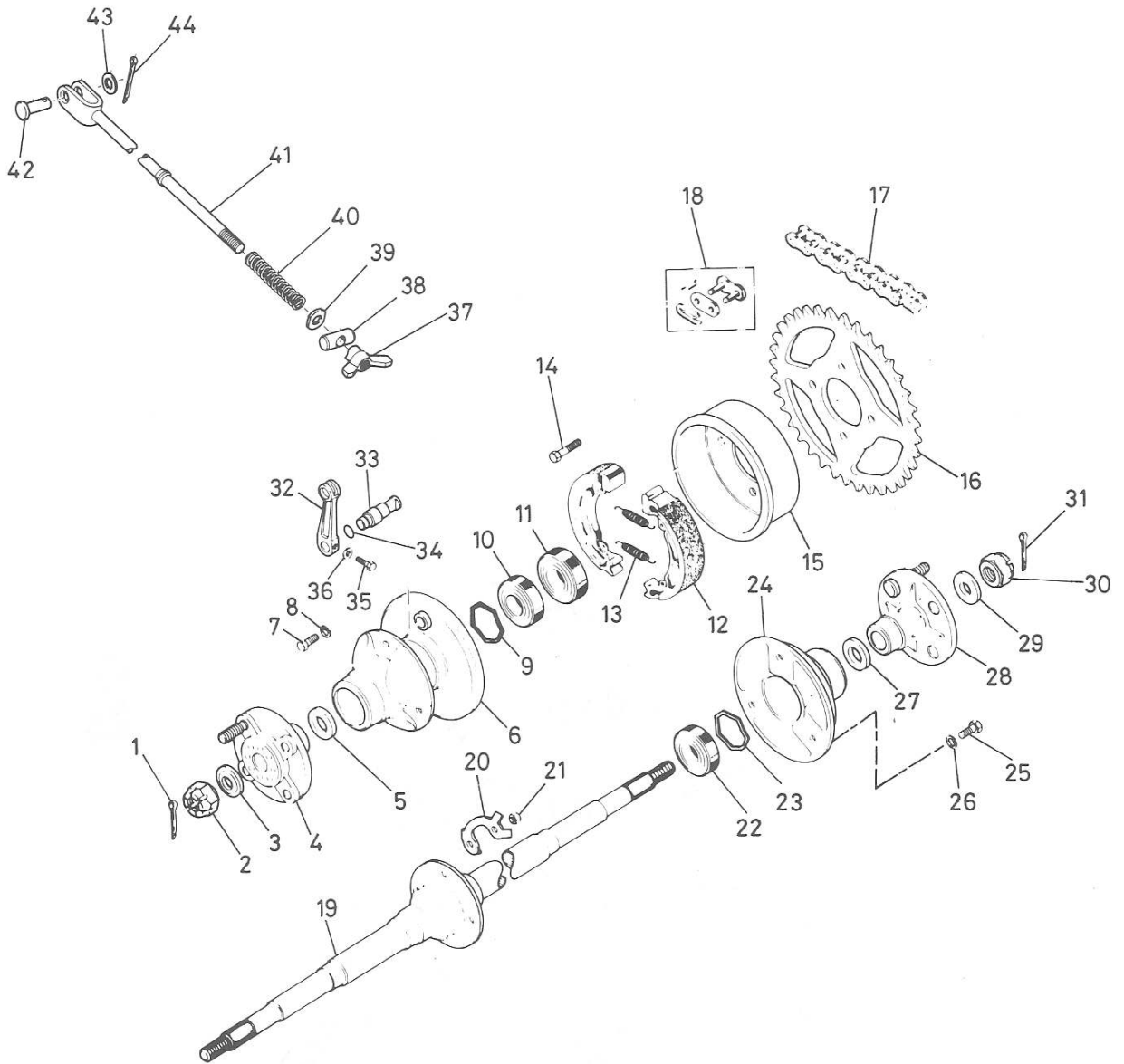


Fig. 6.5 Final drive – KLT200 B and KLT250 A (Sec 6)

- | | | | |
|-------------------------------|-------------------|--------------------------|------------------|
| 1 Cotter pin | 12 Brake shoes | 23 Spring | 34 O-ring |
| 2 Nut | 13 Return springs | 24 Bearing housing | 35 Bolt |
| 3 Washer | 14 Bolt | 25 Bolt | 36 Spring washer |
| 4 Hub | 15 Brake drum | 26 Spring washer | 37 Adjusting nut |
| 5 Collar | 16 Sprocket | 27 Collar | 38 Joint |
| 6 Bearing housing/brake panel | 17 Chain | 28 Hub | 39 Washer |
| 7 Bolt | 18 Master link | 29 Washer | 40 Spring |
| 8 Spring washer | 19 Axle | 30 Nut | 41 Brake rod |
| 9 Spring | 20 Tab washer | 31 Cotter pin | 42 Clevis pin |
| 10 Bearing | 21 Nut | 32 Brake operating lever | 43 Washer |
| 11 Bearing | 22 Bearing | 33 Brake cam | 44 Cotter pin |

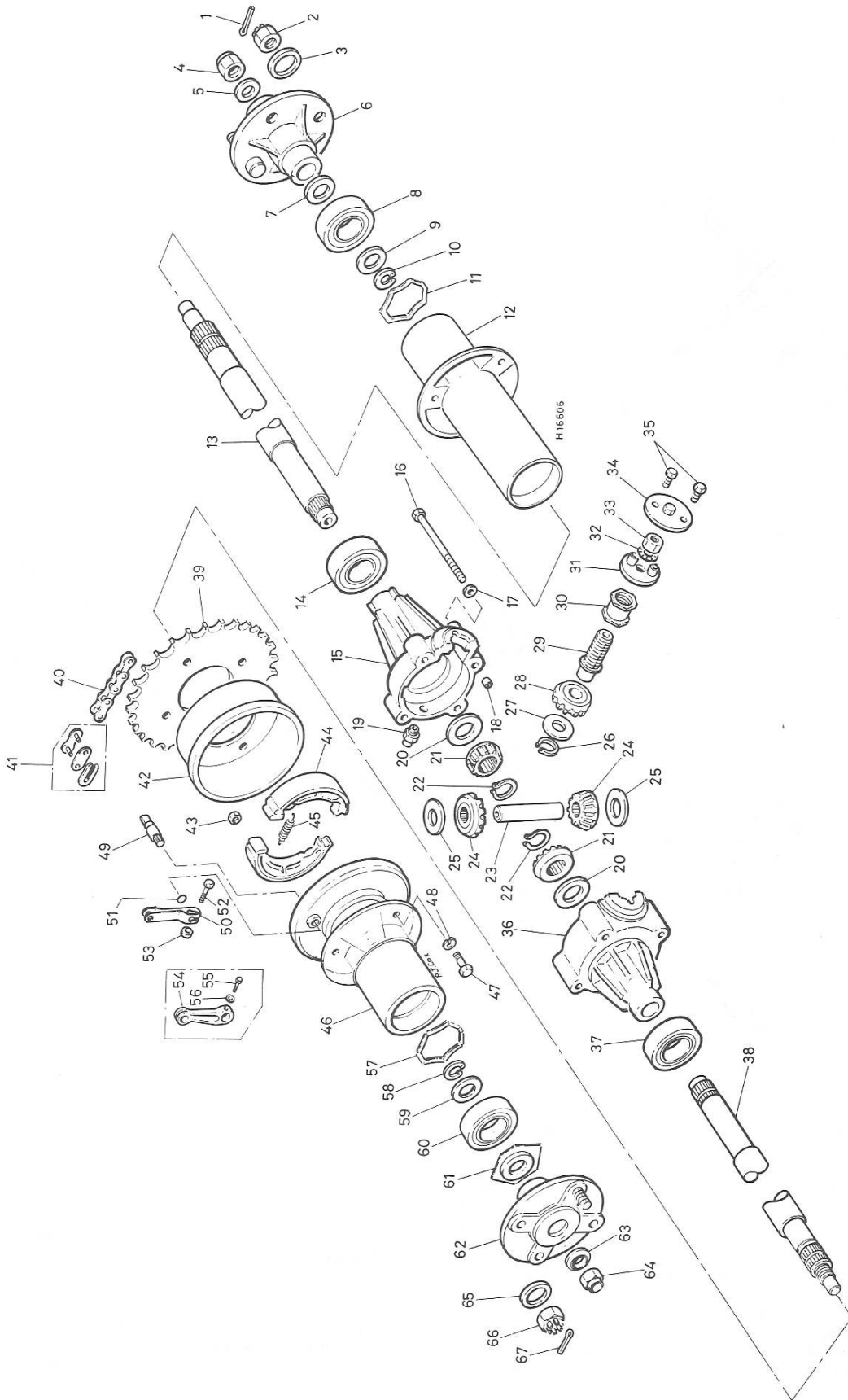




Fig. 6.6 Final drive – KLT200 A (Sec 6)

- | | | | | | |
|----|------------------------------|----|------------------------|----|--------------------------------------|
| 1 | Cotter pin – later models | 24 | Bevel gear | 46 | Bearing housing/brake panel |
| 2 | Nut – later models | 25 | Thrust washer | 47 | Bolt |
| 3 | Washer – later models | 26 | Circlip | 48 | Spring washer |
| 4 | Nut – early models | 27 | Thrust washer | 49 | Brake cam |
| 5 | Washer – early models | 28 | Bevel gear | 50 | Brake operating lever – early models |
| 6 | Hub | 29 | Lock shaft | 51 | O-ring |
| 7 | Collar | 30 | Lock nut | 52 | Bolt |
| 8 | Bearing | 31 | Flange | 53 | Nut |
| 9 | Washer | 32 | Star washer | 54 | Brake operating lever – late models |
| 10 | Circlip | 33 | Nut | 55 | Bolt |
| 11 | Spring | 34 | Locking plate | 56 | Spring washer |
| 12 | Bearing housing | 35 | Bolt | 57 | Spring |
| 13 | Right drive shaft | 36 | Differential left case | 58 | Circlip |
| 14 | Bearing | 37 | Bearing | 59 | Washer |
| 15 | Differential right case | 38 | Left drive shaft | 60 | Bearing |
| 16 | Bolt | 39 | Sprocket | 61 | Collar |
| 17 | Washer | 40 | Chain | 62 | Hub |
| 18 | Dowel pin | 41 | Master link | 63 | Washer – early models |
| 19 | Grease nipple – early models | 42 | Brake drum | 64 | Nut – early models |
| 20 | Thrust washer | 43 | Nut | 65 | Washer – late models |
| 21 | Bevel gear | 44 | Brake shoes | 66 | Nut – late models |
| 22 | Circlip | 45 | Return springs | 67 | Cotter pin – late models |
| 23 | Bevel gear shaft | | | | |





Fig. 6.7 Final drive – KLT200 C, KLT250 C and P (Sec 6)

1 Screw	29 Pinion shafts	56 Brake operating lever
2 Spring washer	30 Pinions	57 O-ring
3 Washer	31 Drain plug	58 Bolt
4 Cover	32 Sealing washer	59 Washer
5 Nut	33 Circlip	60 Collar
6 Hub	34 Differential locking assembly	61 Bearing
7 Stud	35 Shifter rod	62 Circlip
8 Circlip	36 Circlip	63 Hub
9 Bearing	37 Thrust washer	64 Stud
10 Collar	38 Bush	65 Nut
11 Bearing housing	39 Dowel pin	66 Adjustment shims – as required
12 Bolt	40 Differential left case	67 Cam
13 Spring washer	41 Oil seal	68 Screw
14 Right drive shaft	42 Bearing	69 Spring
15 Bearing	43 Oil seal	70 Boot
16 Oil seal	44 Left drive shaft	71 Locking knob
17 Differential right case	45 Sprocket	72 Collar
18 Bolt	46 Chain	73 Nut
19 Washer	47 Brake drum	74 Plug
20 Spacer tube	48 Nut	75 Adjusting nut
21 Washer	49 Washer	76 Joint
22 Circlip	50 Brake shoes	77 Washer
23 Bevel gear	51 Return springs	78 Spring
24 Gasket	52 Bearing housing/brake pedal	79 Rod
25 Differential centre case	53 Bolt	80 Clevis pin
26 Allen bolt	54 Spring washer	81 Washer
27 Washer	55 Brake cam	82 Cotter pin
28 O-ring		