YAMAHA

DT250B / 400B

Service Manual

NOTICE

This manual has been written by Yamaha Motor Company for use by Authorized Yamaha Dealers and their qualified mechanics. In light of this purpose it has been assumed that certain basic mechanical precepts and procedures inherent to our product are already known and understood by the reader.

Without such basic knowledge, repairs or service to this model may render the machine unsafe, and for this reason we must advise that all repairs and/or service be performed by an Authorized Yamaha Dealer who is in possession of the requisite basic product knowledge.

Other information is produced by the U.S. distributor, Yamaha International Corporation, and is necessary to provide total technical coverage regarding the product.

The Research, Engineering, and Service Department of Yamaha are continually striving to further improve all models manufactured by the company. Modifications are therefore inevitable and changes in specifications or procedures will be forwarded to all Authorized Yamaha Dealers and will, where applicable, appear in future editions of this manual.

YAMAHA
1975 DT250B - DT400B
COMBINED SERVICE MANUAL

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FOREWORD

This Service Manual has been written to acquaint the mechanic with the disassembly, reassembly, maintenance, and troubleshooting procedures required to provide optimum performance and longevity of the unit.

The information enclosed should be closely studied to avoid unnecessary repairs and to provide the owner with a sound, safe, dependable machine.

YAMAHA MOTOR CO., LTD.
SERVICE DEPARTMENT

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CHAPTER 1. GENERAL INFORMATION

1-1. Machine identification

The frame serial number is located on the right-hand side of the headstock assembly. The first three digits identify the model. This is followed by a dash. The remaining digits identify the production number of the unit.

The engine serial number is located on a raised boss on the upper rear, left-hand side of the engine. Engine identification follows the same code as frame identification.

Normally, both serial numbers are identical; however, on occasion they may be two or three numbers off.

	Starting Serial Number
DT250B	450-200101
DT400B	501-000101

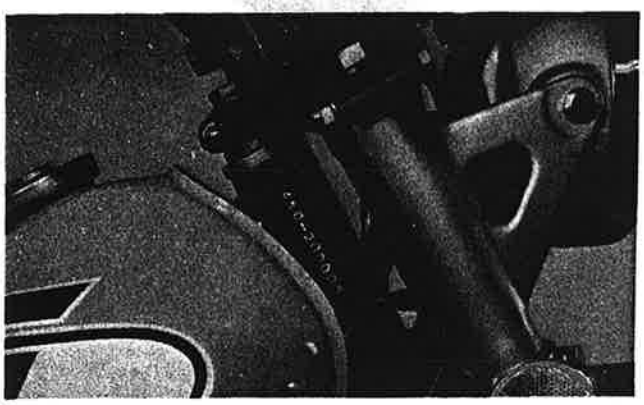

Fig. 1-1-1 Frame serial number

Fig. 1-1-2 Engine serial number

1-2. External view

Fig. 1-2-1

Fig. 1-2-2

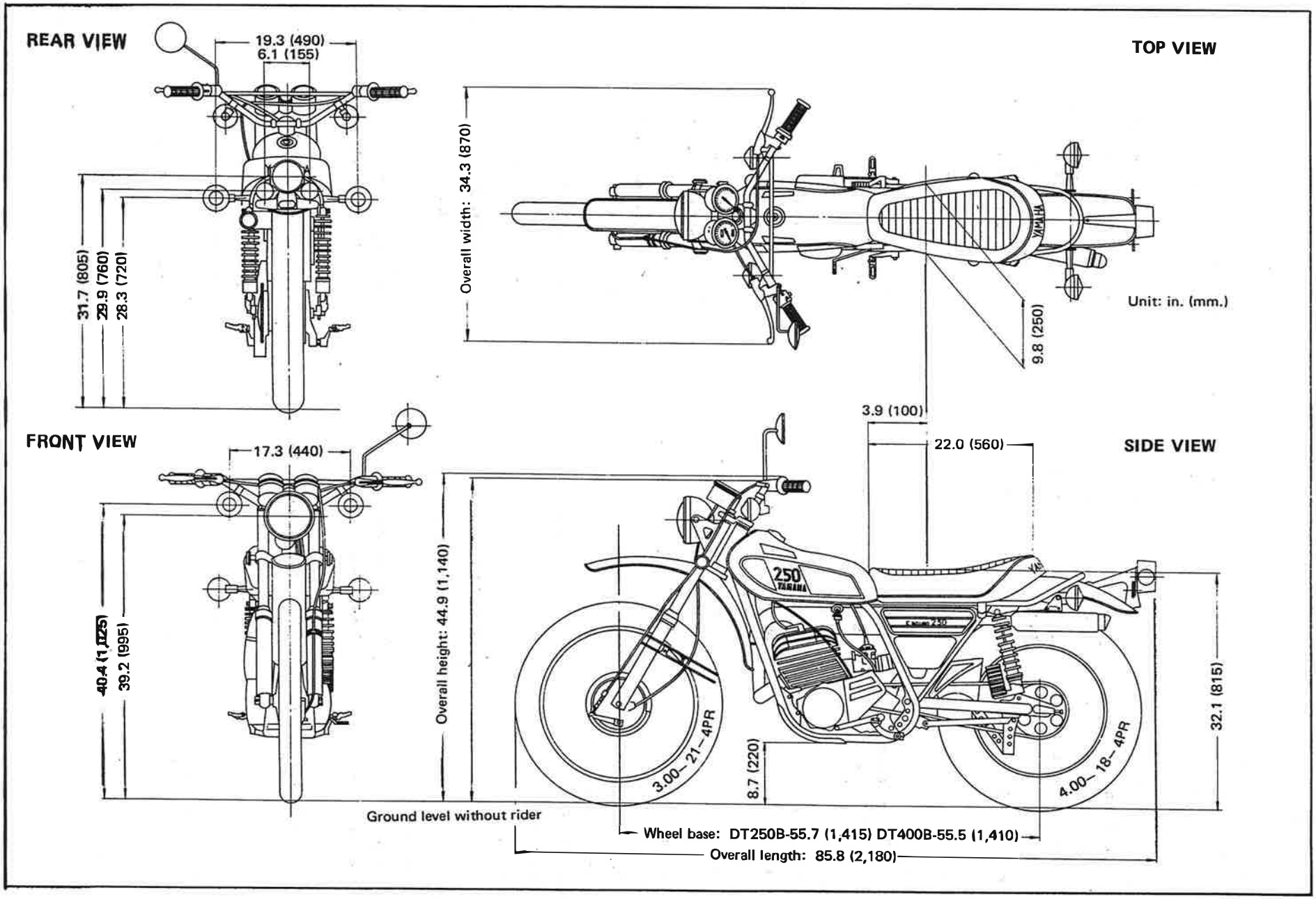
REAR VIEW
19.3 (490)
6.1 (155)
31.7 (805)
29.9 (760)
28.3 (720)
TOP VIEW
Overall width: 34.3 (870)
9.8 (250)
Unit: in. (mm.)
FRONT VIEW
17.3 (440)
40.4 (1,025)
39.2 (995)
3.9 (100)
22.0 (560)
SIDE VIEW
Overall height: 44.9 (1,140)
250
YAMAHA
3.00–21–4PR
4.00–18–4PR
8.7 (220)
32.1 (815)
Ground level without rider
Wheel base: DT250B-55.7 (1,415) DT400B-55.5 (1,410)
Overall length: 85.8 (2,180)

Fig. 1-2-3

1-3. Specifications

A. General specifications

Model	DT250B	DT400B
Dimensions:		
Overall Length	85.8 ins. (2,180 mm.)	85.8 ins. (2,180 mm.)
Overall Width	34.3 ins. (870 mm.)	34.3 ins. (870 mm.)
Overall Height	44.9 ins. (1,140 mm.)	44.9 ins. (1,140 mm.)
Seat Height (unloaded)	32.1 ins. (815 mm.)	32.1 ins. (815 mm.)
Wheelbase	55.7 ins. (1,415 mm.)	55.5 ins. (1,410 mm.)
Min. Ground Clearance	8.7 ins. (220 mm.)	8.7 ins. (220 mm.)
Weight:		
Net	267 lbs. (121 kgs.)	273 lbs. (124 kgs.)
Performance:		
Min. Turning Radius	78.7 ins. (2,000 mm.)	78.7 ins. (2,000 mm.)
Braking Distance	15 m. at 50 km/h. (49.2 ft. at 31 mph.)	15 m. at 50 km/h. (49.2 ft. at 31 mph.)
Engine:		
Model/Type	450/2 Stroke Gasoline	501/2 Stroke Gasoline
Lubricating System	Separate Lubrication (Yamaha Autolube)	Separate Lubrication (Yamaha Autolube)
Cylinder	Single, Forward Inclined, Torque Induction, 7-port	Single, Forward Inclined, Torque Induction, 7-port
Displacement	15.01 cu. in. (246 c.c.)	24.22 cu. in. (397 c.c.)
Bore and Stroke	2.8 x 2.5 ins. (70 x 64 mm.)	3.35 x 2.8 ins. (85 x 70 mm.)
Starting System	Primary Kick Starter	Primary Kick Starter
Ignition System	Magneto Ignition	C.D.I. Ignition
Ignition Timing	3.2 mm. B.T.D.C.	2.9 mm. B.T.D.C.
Spark Plug	B-8ES	B-9ES
Carburetor:		
MFR/Type/Q'ty	MIKUNI/VM28SS/1	MIKUNI/VM32SS/1
Air Cleaner:	Wet, Foam Rubber	Wet, Foam Rubber
Primary Drive:		
Clutch	Wet, Multiple-disk	Wet, Multiple-disk
Primary Reduction System	Helical Gear 65/23 (2.826)	Helical Gear 64/24 (2.666)
Capacities:		
Gasoline Tank/Type Fuel	9.0 lits. (2.4 US gals.) Low-Lead Gasoline	9.0 lits. (2.4 US gals.) Low-Lead Gasoline
Oil Tank/Type	1.5 lits. (1.6 US qts.) Yamalube 2-cycle	1.5 lits. (1.6 US qts.) Yamalube 2-cycle
Transmission/Type	1,000 c.c. (1.05 US qts.) Yamalube 4-cycle	1,000 c.c. (1.05 US qts.) Yamalube 4-cycle
Front Forks/Type	175 c.c. (6.0 ozs.) Yamalube shock fluid	175 c.c. (6.0 ozs.) Yamalube shock fluid
Transmission:		
Type	Constant Mesh 5-speed Forward	Constant Mesh 5-speed Forward

Model	DT250B	DT400B
Transmission:		
Reduction Ratio 1st	38/15 (2.533)	38/15 (2.533)
2nd	34/19 (1.789)	34/19 (1.789)
3rd	30/23 (1.304)	30/23 (1.304)
4th	26/26 (1.000)	26/26 (1.000)
5th	23/30 (0.766)	23/30 (0.766)
Secondary Reduction System	Chain	Chain
Secondary Reduction Ratio	47/14 (3.357)	40/14 (2.857)
Chassis:		
Model	450	501
Frame	Tubular Double Loop	Tubular Double Loop
Suspension System, Front	Telescopic Fork	Telescopic Fork
Suspension System, Rear	Swing Arm	Swing Arm
Cushion System, Front	Coil Spring, Oil Damper	Coil Spring, Oil Damper
Cushion System, Rear	Coil Spring, Oil Damper	Coil Spring, Oil Damper
Steering System:		
Caster	59°30′	59°30′
Trail	5.31 ins. (135 mm.)	5.31 ins. (135 mm.)
Braking System:		
Type of Brake	Internal Expansion	Internal Expansion
Operation System, Front	Right Hand Operation	Right Hand Operation
Operation System, Rear	Right Foot Operation	Right Foot Operation
Tire Size:		
Front	3.00–21–4PR	3.00–21–4PR
Rear	4.00–18–4PR	4.00–18–4PR
Flywheel Magneto:		
Model	FOOOTO1971	FOOOTO2171
Manufacturer	MITSUBISHI	MITSUBISHI
Battery:		
Model	6N4B-2A or 6N4B-2A-3	6N4B-2A or 6N4B-2A-3
Capacity	6V. 4AH.	6V. 4AH.
Lighting:		
Headlight	6V., 35W./35W.	6V., 35W./35W.
Taillight	6V., 5.3W.	6V., 5.3W.
Stop Light	6V., 17W.	6V., 17W.
Meter Light	6V., 3W. x 2	6V., 3W. x 2
Flasher Light	6V., 17W.	6V., 17W.
High Beam Indicator Light	6V., 3W.	6V., 3W.

Note:

The Research and Engineering Departments of Yamaha are continually striving to further perfect all models. Improvements and modifications are therefore inevitable.

In light of this fact, all specifications within this manual are subject to change without notice. Information regarding changes is forwarded to all Authorized Yamaha Dealers as soon as available.

B. Maintenance specifications

Item	DT250B			DT400B		
	Nominal (New)	Minimum Allowable	Maximum Allowable	Nominal (New)	Minimum Allowable	Maximum Allowable
AUTOLUBE						
Pump Plunger Diameter	5.5φmm.	–	–	5.5φmm.	–	–
Pump Stroke (Max. Throttle)	–	1.85 mm.	2.05 mm.	–	1.85 mm.	2.05 mm.
(Min. Throttle)	–	0.20 mm.	0.25 mm.	–	0.20 mm.	0.25 mm.
Pump Color Code	WHITE (364)			YELLOW(363)		
IGNITION						
Minimum Spark Gap	–	7 mm.	–	–	7 mm.	–
Charge Coil Resistance	1.65 Ω ±10%	–	–	120 Ω ±10%	–	–
Ignition Coil-Primary Resistance		–	–	0.61Ω. ± 10% at 20°C	–	–
Ignition Coil-Secondary Resistance		–	–	6.0KΩ. ± 20% at 20°C	–	–
Ignition Coil-Condenser Capacity	0.30μF	–	–	–	–	–
Ignition Point Gap	0.35 mm.	0.30 mm.	0.40 mm.	–	–	–
Spark Plug Type/Manufacturer	B-8ES/N.G.K.	–	–	B-9ES/N.G.K.	–	–
Spark Plug Gap	–	0.5 mm.	0.6 mm.	–	0.5 mm.	0.6 mm.
Ignition Timing (B.T.D.C.)	3.2 mm.	3.05 mm.	3.35 mm.	2.9 mm.	2.75 mm.	3.05 mm.
ENGINE - TOP END						
Cylinder Head Volume	28.4 c.c.	27.9 c.c.	28.9 c.c.	53.3 c.c.	52.8 c.c.	53.8 c.c.
Cylinder Head Nut Torque	2.1 ~ 2.5 m-kg.	–	–	2.1 ~ 2.5 m-kg.	–	–
Cylinder Allowable Taper	0.008 mm.	–	0.05 mm.	0.008 mm.	–	0.05 mm.
Cylinder Allowable Out-of-Round	–	–	0.01 mm.	–	–	0.01 mm.
Cylinder Bolt Torque	4.2 ~ 4.5 m-kg.	–	–	4.2 ~ 4.5 m-kg.	–	–
Ring End Gap, FREE - Top	5.5 mm.	–	–	11.0 mm.	–	–
Ring End Gap, FREE - 2nd	7.0 mm.	–	–	6.5 mm.	–	–
Ring End Gap, Installed - Top	–	0.20 mm.	0.40 mm.	–	0.30 mm.	0.50 mm.
Ring End Gap, Installed - 2nd	–	0.20 mm.	0.40 mm.	–	0.30 mm.	0.50 mm.
Ring Groove Clearance - Top	–	–	–	–	–	–
Ring Groove Clearance - 2nd	–	0.03 mm.	0.08 mm.	–	0.03 mm.	0.08 mm.
Piston Clearance	–	0.040 mm.	0.045 mm.	–	.040 mm.	0.045 mm.
ENGINE - CLUTCH						
Friction Plate Thickness	3.0 mm.	2.7 mm.	–	3.0 mm.	2.7 mm.	–
Clutch Plate Thickness	1.2 mm.	–	–	1.2 mm.	–	–
Clutch-Warp. Allowance	–	–	0.05 mm.	–	–	0.05 mm.
Housing Bushing I.D.	$31^{+0.001\ mm.}_{+0.022\ mm.}$	–	–	$31^{+0.001\ mm.}_{-0.022\ mm.}$	–	–
Bushing Spacer O.D.	$31^{+0.025\ mm.}_{-0.041\ mm.}$	–	–	$31^{-0.025\ mm.}_{-0.041\ mm.}$	–	–
Bushing/Spacer Clearance	0.035 ~ 0.055 mm.	–	0.075 mm.	0.035 ~ 0.055 mm.	–	0.075 mm.
Main Shaft O.D.	$25^{-0.020\ mm.}_{-0.041\ mm.}$	–	24.95 mm.	$25^{-0.020\ mm.}_{-0.041\ mm.}$	–	24.95 mm.
Bushing Spacer I.D.	$25^{+0}_{-0.010\ mm.}$	–	25.02 mm.	$25^{+0}_{-0.010\ mm.}$	–	25.02 mm.
Shaft/Spacer Clearance	0.020 ~ 0.051 mm.	–	0.060 mm.	0.020 ~ 0.051 mm.	–	0.060 mm.
Securing Nut Torque	600 ~ 700 in-lbs. (7.0~8.0m-kg.)	–	–	600 ~ 700 in-lbs. (7.0~8.0m-kg.)	–	–

Item	DT250B			DT400B		
	Nominal (New)	Minimum Allowable	Maximum Allowable	Nominal (New)	Minimum Allowable	Maximum Allowable
Housing End Play	0.2 mm.	0.1 mm.	0.3 mm.	0.2 mm.	0.1 mm.	0.3 mm.
Spring Free Length	36.4 mm.	35.4 mm.	–	36.4 mm.	35.4 mm.	–
1 Spring Set Max. Length Diff.	–	–	0.5 mm.	–	–	0.5 mm.
Primary-Drive Gear "Lash" No.	–	–	–	–	–	–
Primary-Driven Gear "Lash" No.	–	–	–	–	–	–
Primary-Lash Tolerance	48 –	47 –	49 –	72 –	71 –	73 –
Primary-Reduction Ratio	2.826	–	–	2.666	–	–
Primary Drive Gear Securing Nut Torque	600 ~ 700 in-lbs.. (7.0~8.0 m-kg.)	–	–	600 ~ 700 in-lbs. (7.0~8.0 m-kg.)	–	–
Kick Axle O.D.	–	24.947 mm.	24.980 mm.	–	24.947 mm.	24.980 mm.
Kick Gear I.D.	–	25.000 mm.	25.021 mm.	–	25.000 mm.	25.021 mm.
Axle/Gear Clearance	–	0.020 mm.	0.074 mm.	–	0.020 mm.	0.074 mm.
Ratchet Wheel Spring Free Length	17.2 mm.	15.0 mm.	–	17.2 mm.	15.0 mm.	–
ENGINE - TRANSMISSION						
Main Axle Diameter	–	24.980 mm.	24.959 mm.	–	24.980 mm.	24.959 mm.
Main Axle End Play	0.5 mm.	–	–	0.5 mm.	–	–
Drive Axle Diameter	–	24.987 mm.	25.000 mm.	–	24.987 mm.	25.000 mm.
Drive Axle Clearance	0.5 mm.	–	–	0.5 mm.	–	–
Oil Type	Type "SE"	–	–	Type "SE"	–	–
Oil Quantity	1,000c.c. ± 50	–	–	1,000c.c. ± 50	–	–
ENGINE - CRANKSHAFT						
Small End Play	Less than 0.08 in. (2 mm.)	–	–	Less than 0.08 in. (2 mm.)	–	–
Large End Clearance	–	0.4 mm.	0.5 mm.	–	0.4 mm.	0.5 mm.
Runout-Clutch Side	–	–	0.03 mm.	–	–	0.03 mm.
Runout-Ignition Side	–	–	0.03 mm.	–	–	0.03 mm.
Flywheel Width	$64^{+0}_{-0.05}$ mm.	–	–	$64^{+0}_{-0.05}$ mm.	–	–
ELECTRICAL - LIGHTING and CHARGING						
Fuse Capacity/Quantity	10A. x 2 pcs.	–	–	10A. x 2 pcs.	–	–
Charging Voltage						
Day @ 2,000 r.p.m.	8.5V.	–	–	7.0V.	–	–
Day @ 8,000 r.p.m.	8.5V.	–	–	8.5V.	–	–
Night @ 2,000 r.p.m.	7.0V.	–	–	7.0V.	–	–
Night @ 8,000 r.p.m.	8.0V.	–	–	8.0V.	–	–
Charging Amperage						
Day @ 2,000 r.p.m.	1.8 ± 0.5A.	–	–	1.8 ± 0.5A.	–	–
Day @ 8,000 r.p.m.	2.7 ± 0.5A.	–	–	3.0 ± 0.5A.	–	–
Night @ 2,000 r.p.m.	0.7 ± 0.3A.	–	–	0.7 ± 0.3A.	–	–
Night @ 8,000 r.p.m.	1.5 ± 0.5A.	–	–	1.3 ± 0.5A.	–	–
CARBURETION						
Manufacturer	Mikuni	–	–	Mikuni	–	–
Model Number	VM28SS	–	–	VM32SS	–	–
I.D. Number	49861	–	–	50061	–	–
Venturi Size	28φmm.	–	–	32φmm.	–	–

Item	DT250B			DT400B		
	Nominal (New)	Minimum Allowable	Maximum Allowable	Nominal (New)	Minimum Allowable	Maximum Allowable
Jet Needle/Clip Position	5F21-4	–	–	6F9-4	–	–
Cut Away	3.0	–	–	3.0	–	–
Main Jet	#150	–	–	#160	–	–
Pilot Jet	#50	–	–	#40	–	–
Air Jet	drill 2.5 ϕ	–	–	drill 2.5 ϕ	–	–
Starter Jet	#60	–	–	#60	–	–
Air Screw (Turns Out)	1-3/4	–	–	1-1/2	–	–
Idle Speed	1,300 1,400 r.p.m.	–	–	1,400 1,500 r.p.m.	–	–
Float Level	17.3 ± 2.5 mm	–	–	23.0 ± 2.5 mm	–	–
Reed Valve Securing Screw Torque	8.0 cm-kg.	–	–	8.0 cm-kg.	–	–
CHASSIS						
Front Brake Shoe						
Diameter	160 mm.	155 mm.	–	160 mm.	155 mm.	–
Rear Brake Shoe						
Diameter	150 mm.	145 mm.	–	150 mm.	145 mm.	–
Front Axle Nut Torque	900 ~ 1,100 in-lbs. (10 ~ 12m-kg.)	–	–	900 ~ 1,100 in-lbs. (10 ~ 12m-kg.)	–	–
Front Axle Cap Nut Torque	175 in-lbs. (2.0 m-kg.)	–	–	175 in-lbs. (2.0 m-kg.)	–	–
Front Tire						
Manufacturer	Dunlop			Dunlop		
Pressure	17 lbs/in.^{2} (1.2 kg/cm.^{2})	–	–	17 lbs/in.^{2} (1.2 kg/cm.^{2})	–	–
Tread Type	Trials Universal	–	–	Trials Universal	–	–
Rear Tire						
Manufacturer	Dunlop			Dunlop		
Pressure	21 in.^{2}-lbs. (1.5 kg/cm.^{2})	–	–	21 in.^{2}-lbs. (1.5 kg/cm.^{2})	–	–
Tread Type	Trials Universal			Trials Universal		
Wheel Runout Limits-Lateral	0.08 in. (2 mm.)	–	–	0.08 in. (2 mm.)	–	–
Wheel Runout Limits-Vertical	0.08 in. (2 mm.)	–	–	0.08 in. (2 mm.)	–	–
Wheel Spoke-Torque-Front	27 in-lbs. (0.3m-kg.)	–	–	27 in-lbs. (0.3 m-kg.)	–	–
Wheel Spoke-Torque-Rear	27 in-lbs. (0.3 m-kg.)	–	–	27 in-lbs. (0.3 m-kg.)	–	–
Drive Chain-Size						
Pitch	DID520DS			DID520DS		
No. of Links	102L			98L		
Driven Sprocket Securing Bolt Torque	170 ~ 220 in-lbs. (2.0~2.6m-kg.)	–	–	170 ~ 220 in-lbs. (2.0~2.6m-kg.)	–	–
Front Fork Oil Capacity (each leg)	175 c.c. (5.9 oz.)	–	–	175 c.c. (5.9 oz.)	–	–
Type	SAE "SE" 10W/30	–	–	SAE "SE" 10W/30	–	–
Front Fork Cap Bolt Torque	868 in-lbs. (10 m-kg.)	–	–	868 in-lbs. (10 m-kg.)	–	–

Item	DT250B			DT400B		
	Nominal (New)	Minimum Allowable	Maximum Allowable	Nominal (New)	Minimum Allowable	Maximum Allowable
Front Fork Pinch Bolt Torque	70 ~ 100 in-lbs. (0.8~1.2m-kg.)	–	–	70 ~ 100 in-lbs. (0.8~1.2m-kg.)	–	–
Steering Race Ball Quantity/Size - (Upper)	22/3/16"	–	–	22/3/16"	–	–
Steering Race Ball Quantity/Size - (Lower)	19/1/4"	–	–	19/1/4"	–	–
Steering Stem Pinch Bolt Torque	138 ~ 208 in-lbs. (1.6~2.4m-kg.)	–	–	138 ~ 208 in-lbs. (1.6~2.4m-kg.)	–	–
Handlebar Mounting Bolt Torque	95 ~ 150 in-lbs. (1.1~1.8m-kg.)	–	–	95 ~ 150 in-lbs. (1.1~1.8m-kg.)	–	–
Swing Arm Freeplay Limits	0.4 in. (1.0 mm.)	–	–	0.4 in. (1.0 mm.)	–	–
Swing Arm Pivot Bolt Torque	850 ~ 935 in-lbs. (10 ~ 11m-kg.)	–	–	850 ~ 935 in-lbs. (10 ~ 11m-kg.)	–	–
TORQUE VALUES						
Drive Sprocket Nut	600 ~ 770 in-lbs. (7.0~9.0m-kg.)	–	–	600 ~ 770 in-lbs. (7.0~9.0m-kg.)	–	–
Engine Mounting Bolt 10 mm.	390.6 ~ 477.4 in-lbs. (4.5~5.5m-kg.)	–	–	390.6 ~ 477.4 in-lbs. (4.5~5.5m-kg.)	–	–
Engine Mounting Bolt 8 mm.	217.0 ~ 251.7 in-lbs. (2.5~2.9m-kg.)	–	–	217.0 ~ 251.7 in-lbs. (2.5~2.9m-kg.)	–	–

1-4. Special tools

1. Point Checker
   Parts No. 90890-03031

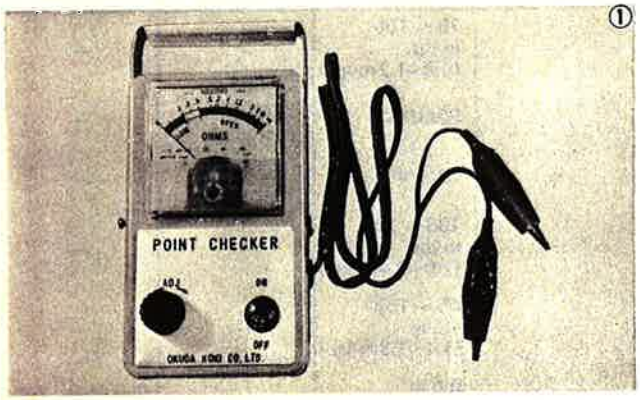

Fig. 1-4-1

2. Pocket Tester
   Parts No. 90890-03043

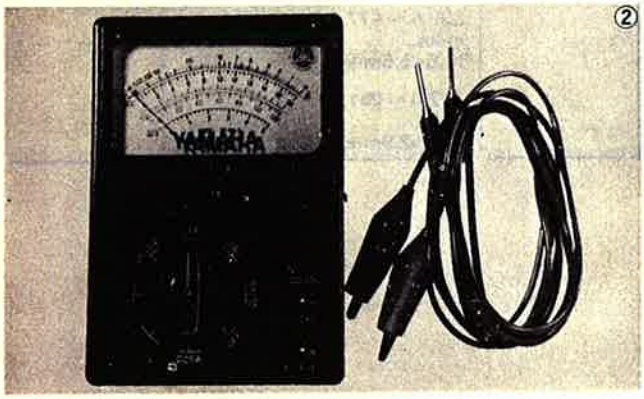

Fig. 1-4-2

3. Electro Tester
   Parts No. 90890-03021

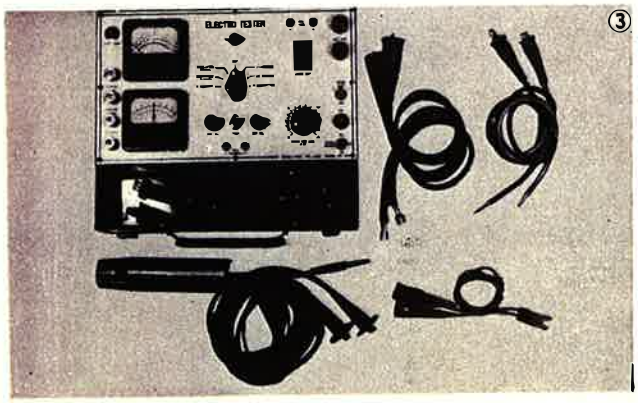

Fig. 1-4-3

4. Dial Gauge
   Parts No. 90890-03002

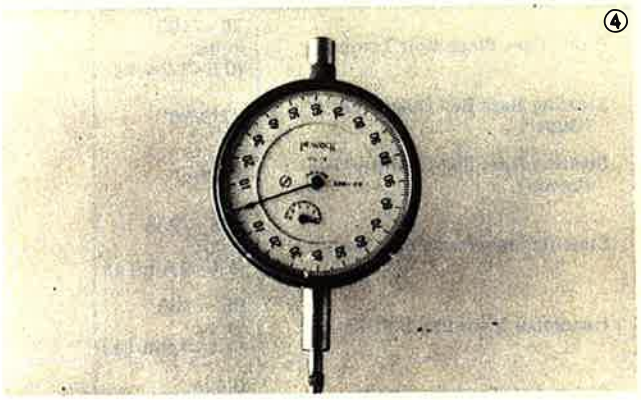

Fig. 1-4-4

5. Dial Gauge Stand
   Parts No. 90890-01039
6. Dial Gauge Needle
   Parts No. 90890-03042

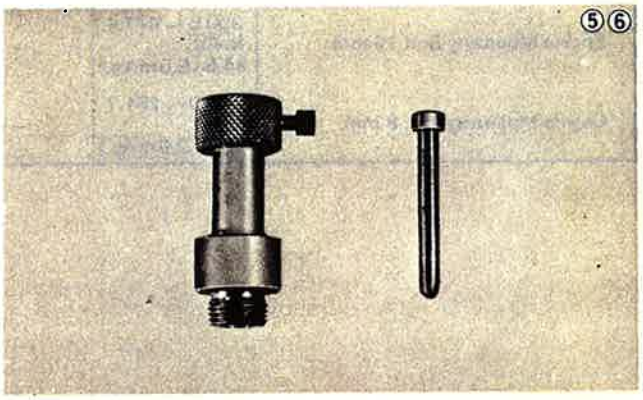

Fig. 1-4-5

7. Flywheel Holding Tool
   Parts No. 90890-01032

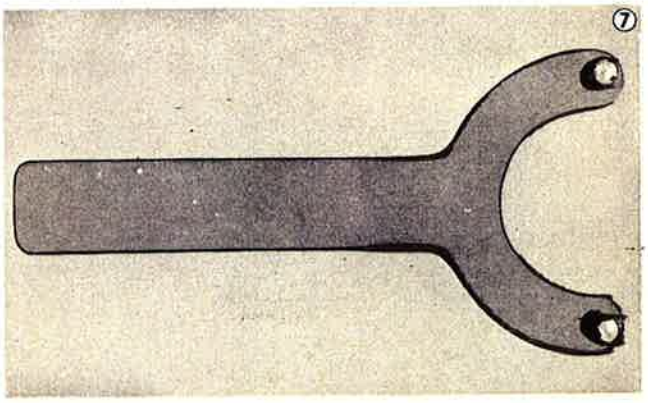

Fig. 1-4-6

8. Flywheel Puller
   Parts No. 90890-01148

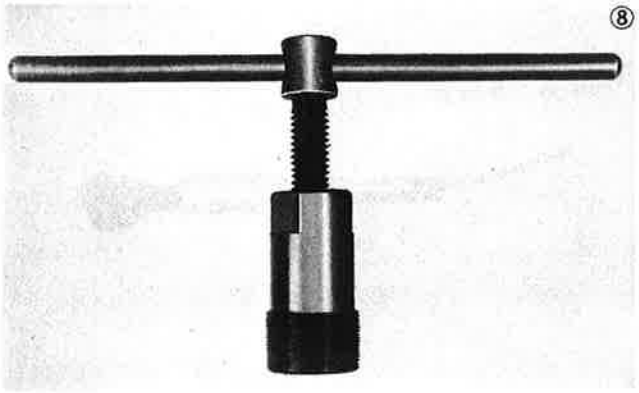

Fig. 1-4-7

9. Clutch Holding Tool
   Parts No. 90890-00000

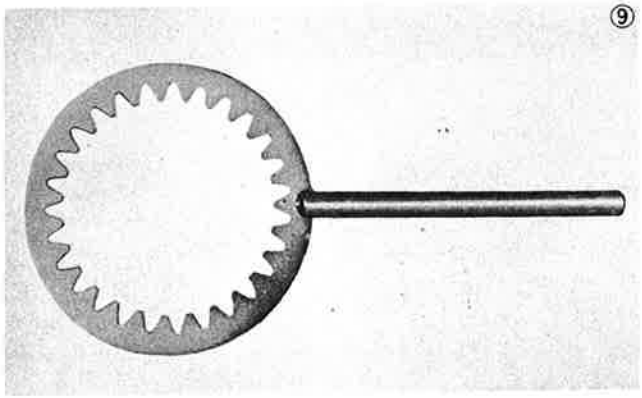

Fig. 1-4-8

10. Crankcase Separating Tool
    Parts No. 90890-01011

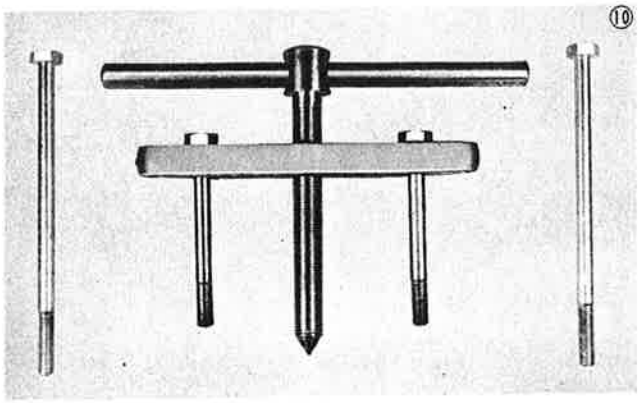

Fig. 1-4-9

11. Spacer
    Parts No. 90890-01016
12. Crankshaft Setting Pot
    Parts No. 90890-01012
13. Crankshaft Setting Tool
    Parts No. 90890-01017

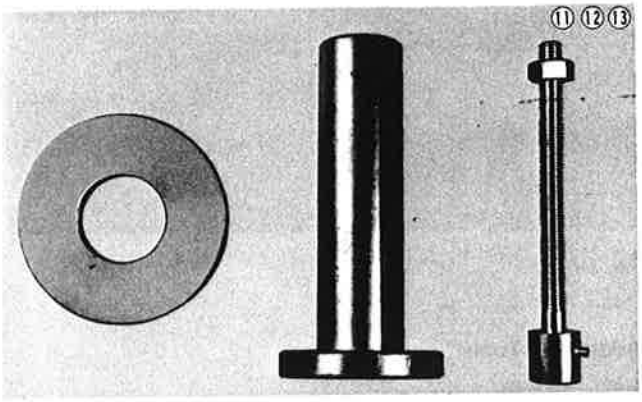

Fig. 1-4-10

14. Steering Nut Wrench
    Parts No. 90890-01051

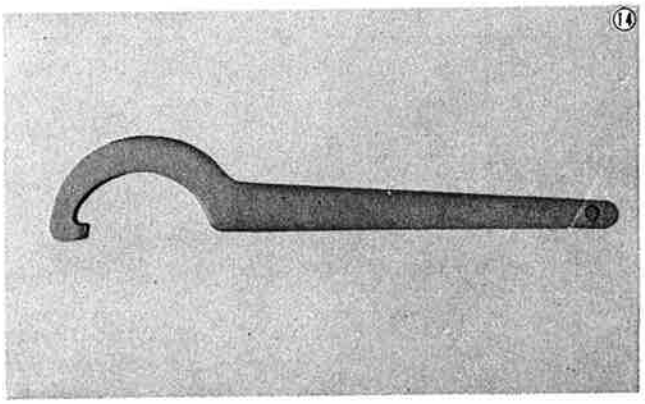

Fig. 1-4-11

15. Spoke Wrench Set
Parts No. 90890-05019

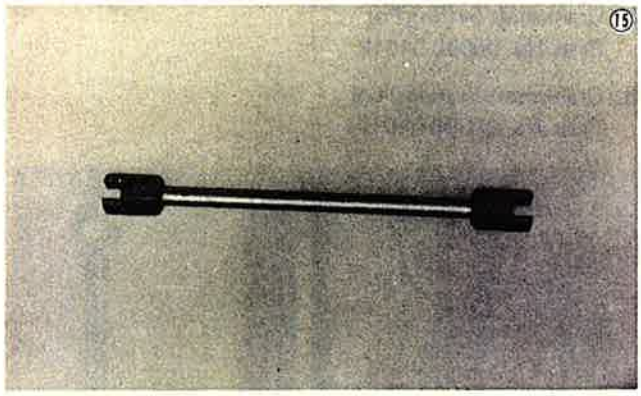

Fig. 1-4-12

16. Hydrometer
Parts No. 90890-03036

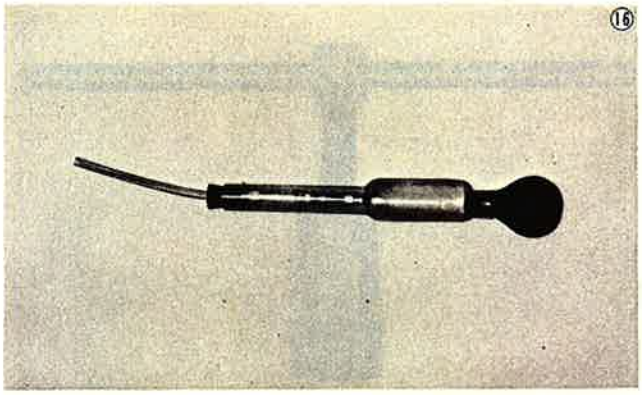

Fig. 1-4-13

Additional Tools

1. Thickness gauge set
2. Torque wrench
3. Tire pressure gauge
4. Fluid measure

CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS

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2

CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS

Introduction:
This chapter includes all information necessary to perform recommended inspections and adjustments. These preventative maintenance procedures, if followed, will insure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information not only applies to vehicles already in service, but also to new vehicles that are being prepared for sale. Any service technician performing preparation work should be familiar with this entire chapter.

2-1. Special tools

1. Point Checker
2. Dial Gauge
3. Dial Gauge Stand
4. Torque Wrench
5. Thickness Gauge Set
6. Steering Nut Wrench
7. Hydrometer
8. Spoke Wrench
9. Tire Pressure Gauge
10. Fluid Measure

2-2. Maintenance intervals charts

The following charts should be considered strictly as a guide to general maintenance and lubrication intervals. You must take into consideration that weather, terrain, geographical location, and a variety of individual uses all tend to demand that each owner alter this time schedule to match his environment. For example, if the motorcycle is continually operated in an area of high humidity, then all parts must be lubricated much more frequently than shown on the chart to avoid damage caused by water to metal parts.

Maintenance intervals

Item	Remarks	Period						
		Initial (miles)				Thereafter every (miles)		
		250	500	1,000	2,000	1,000	2,000	8,000
Brake System (Complete)	Check/Adjust as required – Repair as required		O	O			O	
Clutch	Check/Adjust as required		O	O			O	
Battery	Top-off/Check specific gravity as required – Monthly or →	O	O	O		O		
Spark Plug	Inspect/Clean or Replace as required	O	O	O		O		
Wheels & Tires	Tire Pressure/Spoke-tension/Rim Runout	O	O	O		O		
Fittings & Fasteners	Tighten before each trip and/or →	O	O	O		O		
Autolube	Cable operation/Adjustment	O	O	O			O	
Drive Chain	Tension/Alignment	O	O	O		O	O	
Oil Level Check	Includes Transmission and Autolube (See Service Note #1	O	O	O		O		
Air Filter	Foam type (See Service Notes #2 and #3)	O	O	O		O		
Fuel Petcock	Clean/Flush tank as required	O		O			O	
Ignition Timing	Adjust/Clean or Replace parts as required		O	O			O	
Carburetor Adjustment	Check Operation/Adjustment/Fittings		O	O			O	
Decarbonize Engine	Includes exhaust system (See Engine Overhaul-Chapt. 3)			O			O	

Service Notes:

#1. Check Autolube tank level before each ride. Top off when oil level shows at the sight glass or before any prolonged use. See "Lubrication intervals" for type oil to use.

#2. Foam element air filters must be damp with oil at all times to function properly. Remove, clean, and oil filter at least once per month or every 250 ~ 500 miles; whichever occurs first. (If extremely hard usage, such as dirt riding, clean and lube daily.) See "Lubrication intervals" for additional details.

#3. For additional information regarding drive chain, engine oil level, wet-type air filter, see "Lubrication Intervals."

Lubrication intervals

Item	Remarks	Type	Period							
			Initial (miles)				Thereafter every (miles)			
			250	500	1,000	2,000	1,000	2,000	4,000	8,000
Autolube	See "Service Notes"	#1	See "Service Notes"							
Transmission Oil	Warm engine before draining	#2				O	Check	O		
Drive Chain	Lube/Adjust as required	#4	See "Service Notes"							
Drive Chain	Remove/Clean—Lube/Adjust	#4				O		O		
Air Filter	Foam Type	#9	See "Service Notes"							
Control & Meter Cables		#4		O				O		
Throttle Grip & Housing	Light application	#5		O				O		
Tacho & Speedo Gear Housings	Light application	#5			O				O	
Rear Arm Pivot Shaft	Apply until shows	#6			O			O		
Brake Pedal Shaft	Light application	#5			O			O		
Change Pedal Shaft	Light application	#5			O			O		
Stand Shaft Pivot	Light application	#5			O			O		
Front Forks	Drain completely/Check Specs.	#3		Check		O		Check	O	
Steering Ball Races	See "Chassis Overhaul" Chapt. 5	#7				O			O	
Point Cam Lubricating Wick	Very light application	#8			O				O	
Wheel Bearings	See "Chassis Overhaul" Chapt. 5	#7				O			O	

Recommend Lubricant Type

No. 1 Check tank level before each ride. Top off when oil level is at sight glass or before any prolonged use. Use the following lubricant (in order of preference):
"Yamalube 2-cycle", or; two-stroke oil labeled "BIA certified for service TC-W"

No. 2 At ambient temperatures of 45 ~ 90°F, use "Yamalube 4-cycle". Do not use "additives" in oil.

No. 3 Use 10W/30"SE" motor oil. (If desired, specialy type lubricants of quality manufacture may be used.)
"Drive Chains" – Lube every 150 ~ 200 miles. If severe usage, every 50 ~ 100 miles.

No. 4 Use cable/Chain Lubricant (specialty types available—use name-brand, quality manufacturer).

No. 5 Light duty: smooth, light-weight, "white" grease. Heavy duty: standard chassis lube grease (do not use lube grease on throttle/housing).

No. 6 Use standard chassis lube grease-smooth, not coarse.

No. 7 Medium-weight wheel bearing grease of quality manufacture-preferrably waterproof.

No. 8 Light-weight machine oil.

No. 9 Air filters-foam element air filters must be damp with oil at all times to function properly. Clean and oil monthly or per mileage.
If hard usage, clean and lube daily. Do not over-oil. Use SAE 30W.

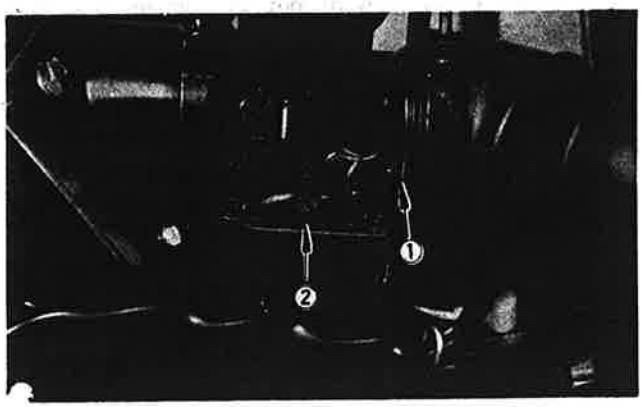
2-3. Engine

A. Carburetor

1. Make certain that throttle cable freeplay is proper.
2. Pilot air screw
   Turn air adjusting screw (1) until it lightly seats, then back it out 1-1/2 turns. This adjustment can be made with engine stopped. (Fig. 2-3-1)
3. Start the engine and let it warm up.
4. Idle speed screw
   Turn throttle stop screw (2) in or out to achieve smooth engine operation at idle speed specified in Carburetor Setting Table. (Fig. 2-3-1)

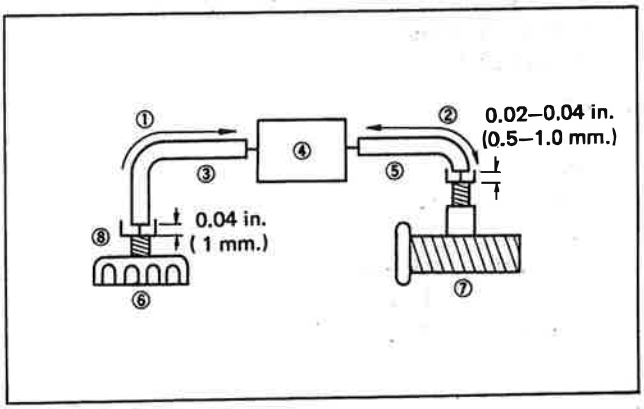
Note:
The pilot air and idle speed screws are separate adjustments but they must be adjusted at the same time to achieve optimum operating condition at engine idle speeds.

5. Throttle cable
   After engine idle speed is set, make cable freeplay adjustment at cable adjustor (8) near throttle grip. Loosen locknut and turn adjustor until there is 0.02 ~ 0.04 in. (0.5 ~ 1.0 mm.) freeplay between throttle cable housing and cable adjustor. Retighten locknut. Loosen cable adjustor locknut (at top of carburetor) and turn cable adjustor until there is 0.04 in. (1.0 mm.) freeplay in cable "B". Retighten locknut. (Fig. 2-3-2)



1. Pilot air screw
2. Idle speed screw

Fig. 2-3-1



1. Slide
2. Slide
3. Cable "B"
4. Junction block
5. Cable "A"
6. Carburetor cap
7. Throttle grip
8. Cable adjustor

Fig. 2-3-2

B. Air cleaner

1. Remove the air cleaner element assembly. (Fig. 2-3-3)

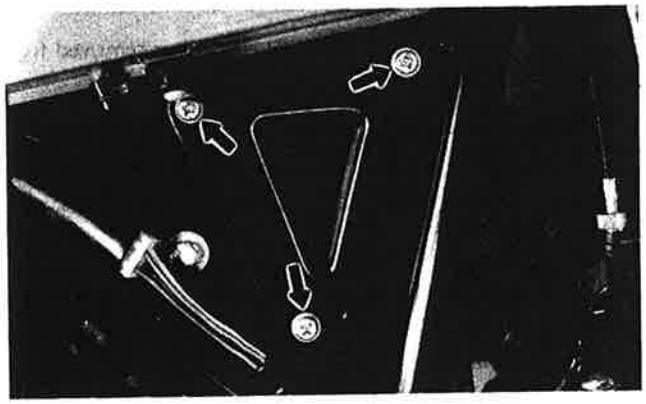


Fig. 2-3-3

2. Slip the element off the wire mesh guide. (Fig. 2-3-4)
3. Wash the element gently, but thoroughly, in solvent.
4. Squeeze excess solvent out of element and dry. (Fig. 2-3-5)
5. Pour a small quantity of 30 W. motor oil onto cleaner element and work thoroughly into the porous foam material. Element must be damp with oil but not dripping.
6. Re-insert the wire mesh cleaner element guide into the element.
7. Coat the upper and lower edges of the cleaner element with lube grease. (This will provide an air-tight seal between the cleaner case cover and cleaner seat.)
8. Re-install the element assembly, case cover and seat.

Note:

Each time cleaner element maintenance is performed, check the air inlet to the cleaner case for obstructions. Check the air cleaner joint rubber to the carburetor and manifold fittings for an air-tight seal. Tighten all fittings thoroughly to avoid the possibility of unfiltered air entering the engine.

Caution:

Never operate the engine with the air cleaner element removed.

This will allow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the cleaner element will affect carburetor jetting with subsequent poor performance and possible engine overheating.

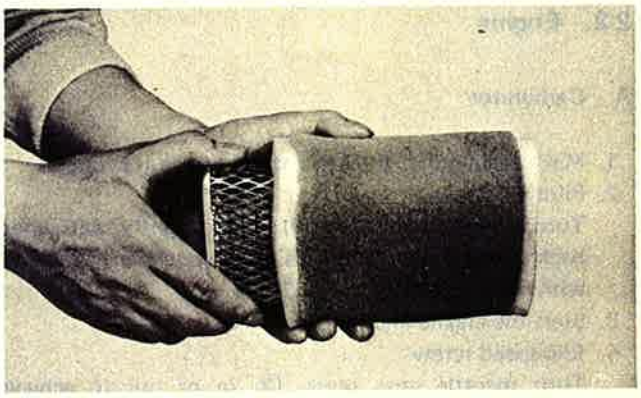


Fig. 2-3-4

Fig. 2-3-5

C. Autolube pump

1. Cable adjustment
   a. Remove Autolube pump cover, which is located on forward portion of the righthand crankcase cover. (Fig. 2-3-6)
   b. Rotate throttle slightly until all slack is removed from all cables. Hold the position.

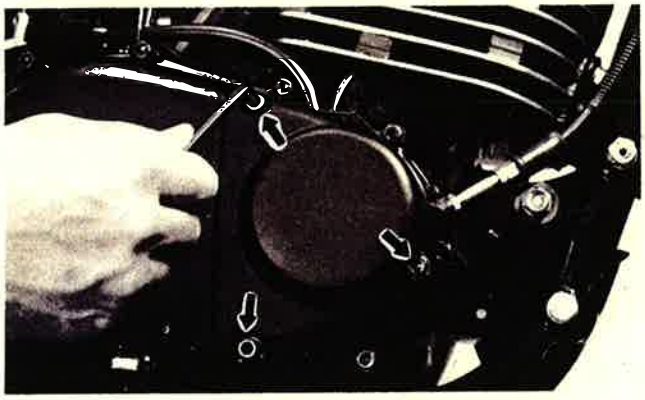


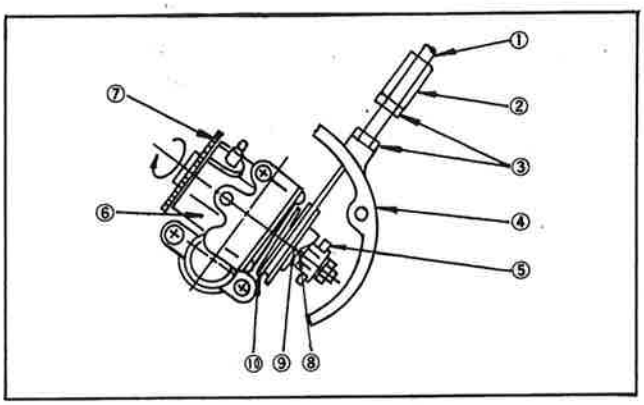
Fig. 2-3-6

c. Check to see that Autolube pump plunger pin (8) is aligned with the mark on the Autolube pump pulley. (Fig. 2-3-7)

d. If the mark (9) and pin (8) are not in alignment, loosen cable length adjustor lock nut on top of crankcase cover and adjust cable length until alignment is achieved. (Fig. 2-3-7)
Tighten adjustor locknut.

Note:

Before adjusting Autolube cable always set throttle cable freeplay first. (Refer to 2-3, A, 5.)



1. Pump cable
2. Cable adjusting bolt
3. Lock nut
4. Crank case
5. Adjusting plate
6. Oil pump
7. Starter plate
8. Plunger pin
9. Mark
10. Pump cable pulley

Fig. 2-3-7

2. Pump Stroke Adjustment

a. With throttle closed, rotate starter plate (7) until the pump plunger moves fully out and away from the pump body its outermost limit. (Fig. 2-3-8)

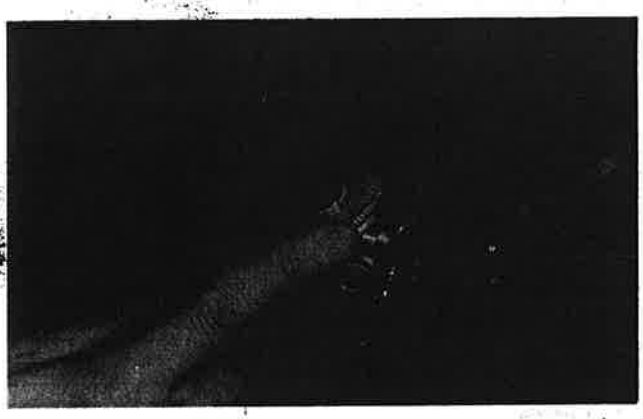


Fig. 2-3-8

b. Measure gap with thickness gauge between raised boss on pump adjust pulley and adjust plate. If clearance is not correct, remove adjust plate locknut and adjust plate. (Fig. 2-3-9)

Minimum Pump Stroke:
0.008 ~ 0.010 in. (0.20 ~ 0.25 mm.)

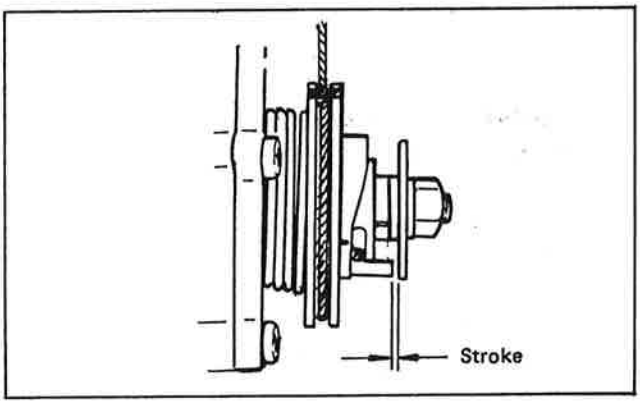


Fig. 2-3-9

c. Remove or add an adjustment shim as required. (Fig. 2-3-10)
d. Reinstall adjust plate and locknut. Tighten the lock nut.
Re-measure gap. Repeat procedure as required.

3. Bleeding the pump
The Autolube pump and delivery lines must be bleed on the following occasions:
1) A new machine out of the crate.
2) Whenever the Autolube tank has run dry.
3) Whenever any portion of the Autolube system is disconnected.

a. Remove the pump cover.

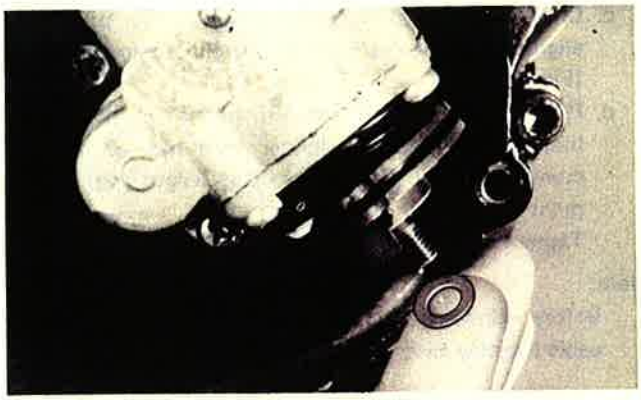


Fig. 2-3-10

b. Remove the pump bleed screw and allow 3 to 5 minutes to fill pump with oil and begin to drain from bleed screw hole. (Fig. 2-3-11)
c. Turn the throttle to the full open position.
d. Rotate the starter plate until a steady flow of oil, with no air bubbles, comes out.
e. Re-install bleed screw and pump cover.

Fig. 2-3-11

D. Engine and transmission oil

1. Engine
a. Autolube oil
We recommend that first choice be Yamaha 2-cycle oil. If for any reason you should use another type, the oil should meet or exceed BIA certification "TC-W". Check container top or label for service specification. If above oils not available, use a 30 or 40 wt. 2-stroke oil for air-cooled engines.

Caution:
Under extremely cold conditions (+32 degrees Fahrenheit or below) 30 and 40 wt. oils become very thick and will not flow as readily to the Autolube pump. This may cause oil pump starvation. Yamaha 2-cycle oil will flow normally to the pump at ambient temperatures down to 0°F.

b. Autolube tank
Always check Autolube tank oil level before operating machine. If oil level shows at sight glass window. (Fig. 2-3-12)
1) Raise seat.
2) Remove filler cap and top off tank.

Fig. 2-3-12

2. Transmission

a. The dip stick is located above and slightly in front of the kick crank. To check level, start the engine and let it run for several minutes to warm and distribute oil. Unscrew the dipstick and clean. Set it on the case threads in a level position. Remove and check level. (Fig. 2-3-13)

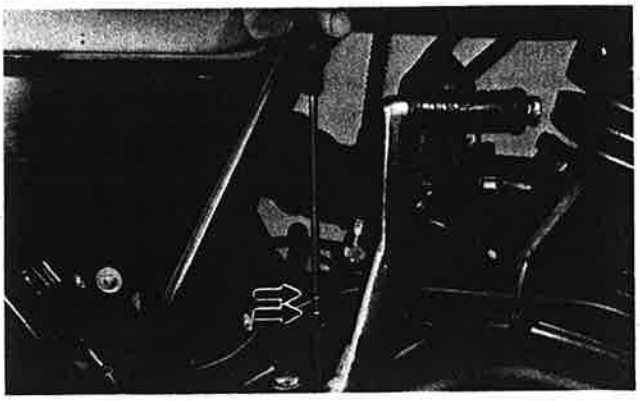


Fig. 2-3-13

Note:

Be sure the machine is level and on both wheels.

b. The stick has Minimum and Maximum marks. The oil level should be between the two. Top off as required.

Recommended Oil:

Yamaha 4-cycle oil or 10W30 automotive oil with SE rating

c. A drain bolt is located on the bottom of the crankcase. (Fig. 2-3-14)

With the engine warm, remove the plug and drain oil. Re-install plug and add fresh oil.

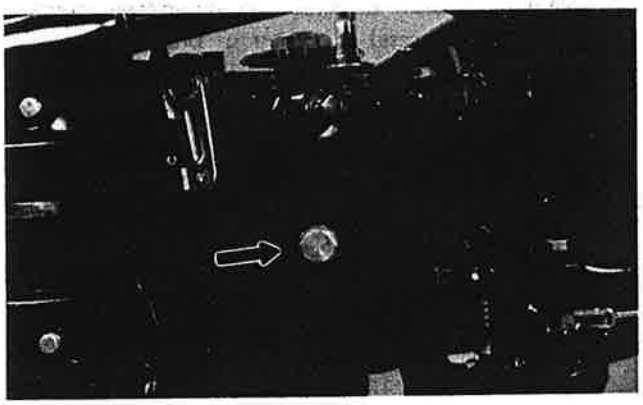


Fig. 2-3-14

Transmission Drain Plug Torque: 174 ~ 217 in-lbs. (2.0 ~ 2.5 m-kgs.)
Transmission Oil Quantity: DT250B 1,000 c.c. (1.1 U.S.qt.) DT400B 1,000 c.c. (1.1 U.S.qt.)

Transmission oil should be replaced several times during the break-in period. If the unit is used for competition, oil replacement should also be often.

Caution:

Under no circumstances should any additives be included with the transmission oil. This oil also lubricates and cools the clutch. Many additives will cause severe clutch slippage.

E. Clutch

This model has two clutch cable length adjusters and a clutch mechanism adjuster. Cable length adjusters are used to take up slack from cable stretch and to provide sufficient freeplay for proper clutch operation under various operating conditions. The clutch mechanism adjuster is used to provide the correct amount of clutch "throw" for proper disengagement. Normally, once the mechanism is properly adjusted, the only adjustment required is maintenance of freeplay at the clutch handle lever.

1. Freeplay adjustment

a. Loosen either the handle lever adjuster locknut or the cable inline length adjuster locknut.

b. Turn the length adjuster either in or out until proper lever freeplay is achieved. (Fig. 2-3-15)

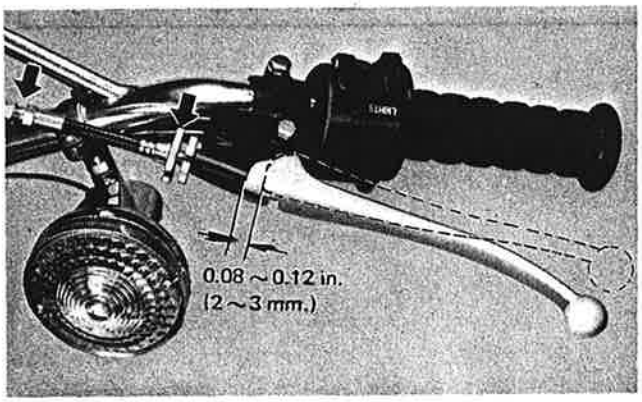


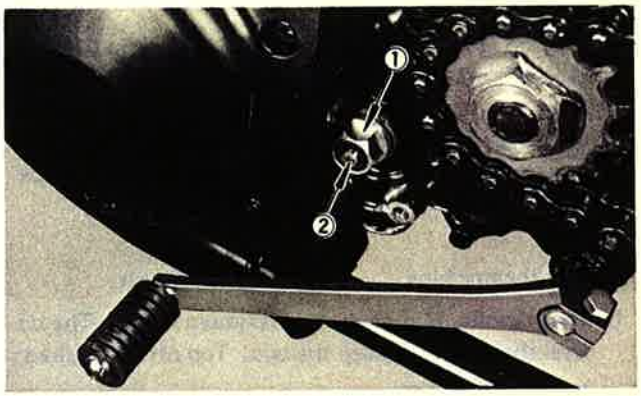
Fig. 2-3-15

2. **Mechanism** adjustment
   a. Remove rear, left-hand crankcase cover. Note position of clutch axle lever under engine.
   b. Loosen adjusting screw lock nut and fully tighten eccentric adjusting screw.
   c. Turn either cable length adjuster in or out until lever is positioned slightly behind main axle center line.
   d. Back eccentric adjust screw out until axle lever shaft contacts clutch push rod inside engine. Turn adjust screw in approximately 1/8 turn and tighten lock nut. Readjust handle lever freeplay as required. (Fig. 2-3-16), (Fig. 2-3-17)

Note:

After adjusting, pull clutch lever in and hold against handle grip. Measure distance from outer cable stopper (bottom of crankcase) to center of brake lever clevis pin. If distance is less than specified, loosen cable length adjuster slightly to achieve minimum distance.

Minimum Distance: 2.165 ins. (5.5 mm.)



1. Adjusting screw lock nut 2. Eccentric adjusting screw

Fig. 2-3-16

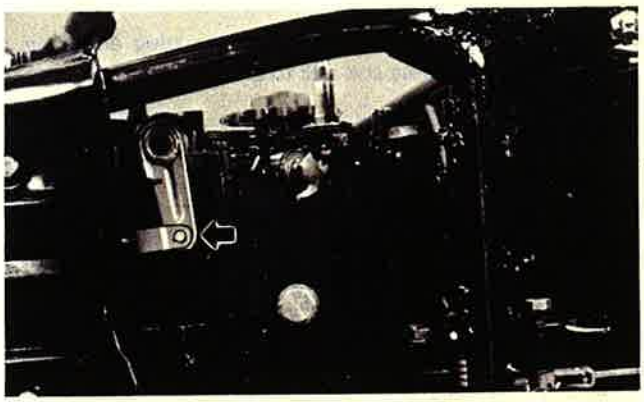


Fig. 2-3-17

F. Cylinder head

Check torque of cylinder head holding nuts. (Fig. 2-3-18) Tighten in a crisscross pattern.

Cylinder Head Nut Torque: 180 ~ 220 in.-lbs. (2.1 ~ 2.5 m-kgs.)

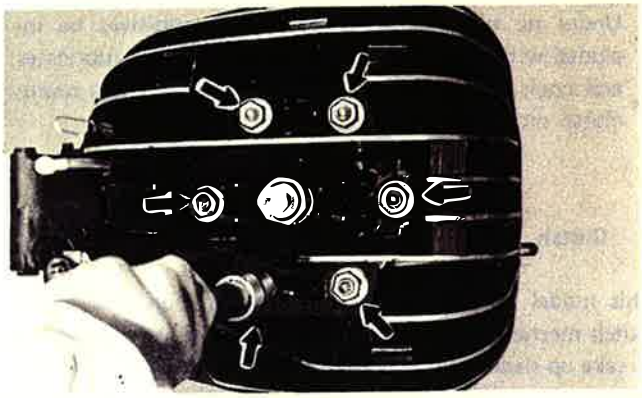


Fig. 2-3-18

2-4. Chassis

A. Fuel petcock

1. Clean fuel filter
   a. Turn fuel petcock to "off-position" and disconnect fuel pipe.
   b. Remove filter cap and clean filter. (Fig. 2-4-1)

Note:
If filter is damaged, replace.

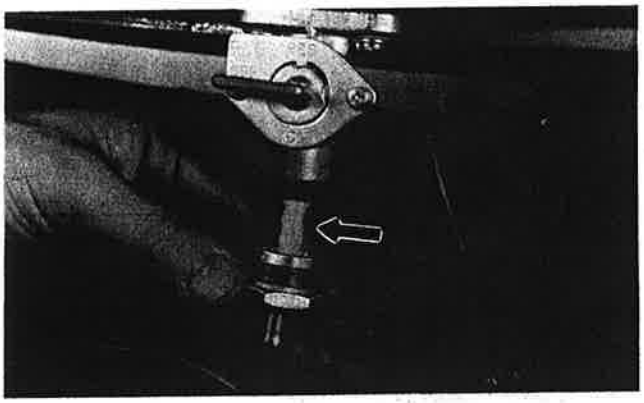
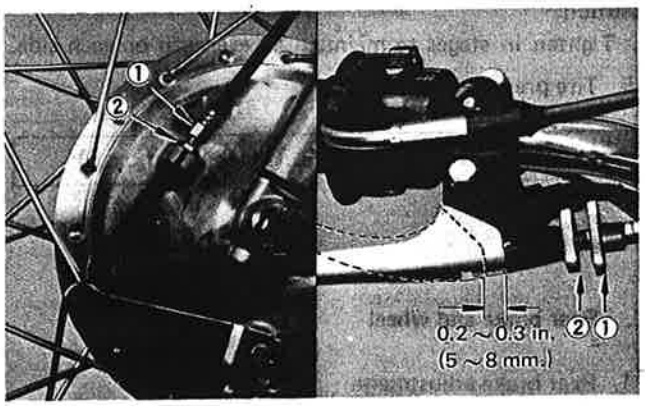


Fig. 2-4-1

B. Front brake and wheel

1. Front brake adjustment
   Front brake cable freeplay can be adjusted to suit rider preference, but a minimum freeplay of 0.2 ~ 0.3 in. (5 ~ 8 mm.) should be maintained. Freeplay can be adjusted at handle bar lever or brake shoe plate.
   a. Loosen the adjuster locknut (2).
   b. Turn the adjuster (1) in or out until adjustment is suitable.
   c. Tighten the adjuster locknut (2). (Fig. 2-4-2)
2. Brake lining check
   Brake linings can be checked through the inspection hole in the shoe plate.
   if thickness is less than 0.08 in. (2 mm.), replace the brake shoes.



1. Adjuster 2. Adjuster locknut

Fig. 2-4-2

3. Spoke adjustment and torque
   a. Raise the wheel off the ground. Spin. Check rim run out. (Fig. 2-4-3)

Rim Runout Limits	Vertical:	0.08 in. (2 mm.)
	Lateral:	0.08 in. (2 mm.)

Fig. 2-4-3

b. Check each spoke for tightness. (Fig. 2-4-4)

Spoke Torque Front Wheel: 2.5 in-lbs. (0.3 m-kg.)
Rear Wheel: 2.5 in-lbs. (0.3 m-kg.)

Note:

If loose spokes are found, tighten and repeat step 3.

4. Front axle
   a. Check axle nut. (Fig. 2-4-5)

Front Axle Nut Torque:
900 ~ 1,100 in-lbs. (10 ~ 12 m-kgs.)

b. Check axle holder nuts (right side).

Front Axle Holder Nut Torque:
70 ~ 110 in-lbs. (0.8 ~ 1.25 m-kgs.)

Caution:

Tighten in stages to maintain an even gap on each side.

5. Tire pressure

Front Tire Pressure: 17 in.^{2}-lbs. (1.2 kg/cm.^{2})

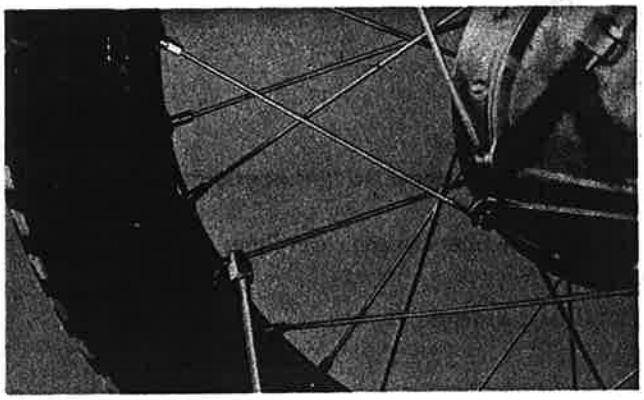


Fig. 2-4-4

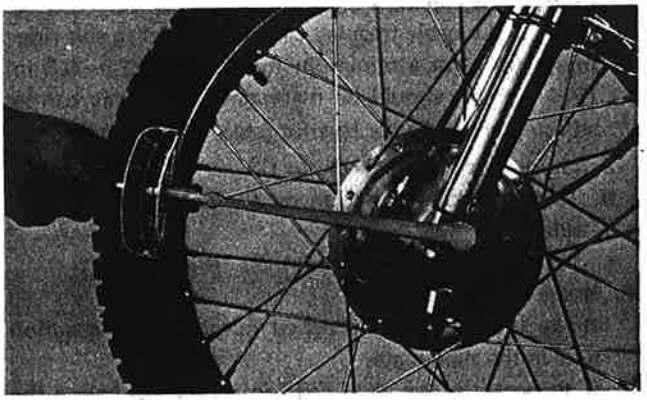


Fig. 2-4-5

C. Rear brake and wheel

1. Rear brake adjustment
   Adjust rear brake pedal play to suit, providing a minimum of 25 mm. freeplay.
   Adjustment is accomplished as follows:
   a. Using a 13 mm. wrench, turn the adjusting nut on the rear brake rod in or out until brake pedal freeplay is suitable (25 mm. minimum freeplay). (Fig. 2-4-6 & 2-4-7)

Note:

Rear brake pedal adjustment must be checked whenever chain is adjusted or rear wheel is removed and then re-installed.

2. Brake lining check
   Brake linings can be checked through the inspection hole in the shoe plate.
   If thickness is less than 0.08 in. (2 mm.), replace the brake shoes.
3. Spoke adjustment and tension
   Adjust rear wheel spoke tension per front wheel instructions.
4. Rear axle
   Check axle nut.

Rear Axle Nut Torque:
900 ~ 1,100 in.-lbs. (10 ~ 12 m-kgs.)

5. Tire pressure

Rear Tire Pressure: 21 in.^{2}-lbs. (1.5 kg./cm.^{2})

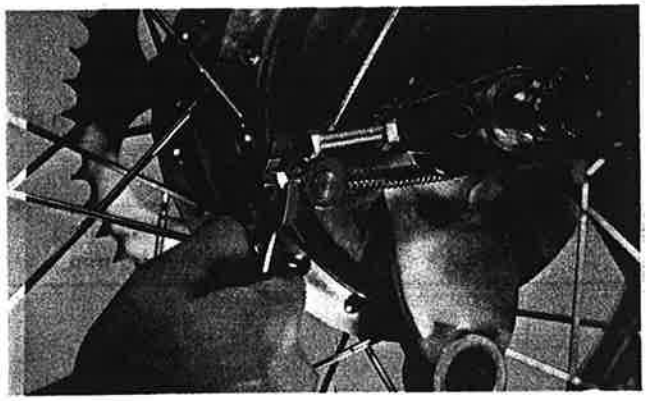


Fig. 2-4-6

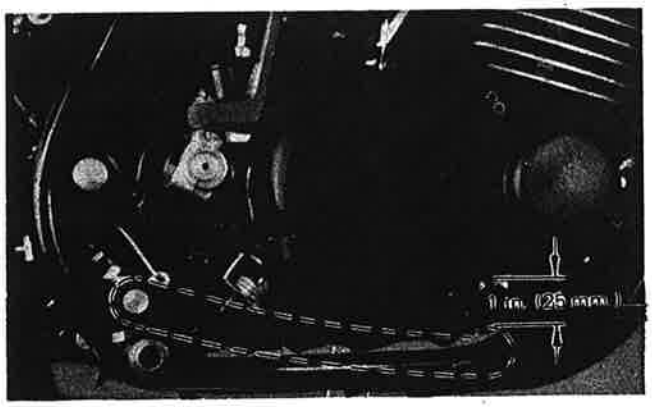


Fig. 2-4-7

D. Drive chain

1. Drive chain adjustment
   To adjust drive chain, proceed as follows:
   a. Remove rear axle cotter pin (4).
   b. Loosen rear axle securing nut (3).
   c. With rider in position on machine both wheels on ground, set axle adjusters until there is 0.59 to 0.79 in. (15 to 20 mm.) freeplay in the drive chain at the bottom of the chain at a point midway between the drive and driven axles. (Fig. 2-4-8)
   d. Turn adjusters (chain puller bolts) both left and right, until axle is situated in same positions as shown by position marks (1) on swing arm axle tabs.
   e. Tighten the rear axle securing nut (3).

Axle Nut Torque: 900 ~ 1,100 in-lbs.

   f. Install a new cotter pin and bend the end over.

Note:
Tighten bolt locknuts thoroughly. (Fig. 2-4-9)

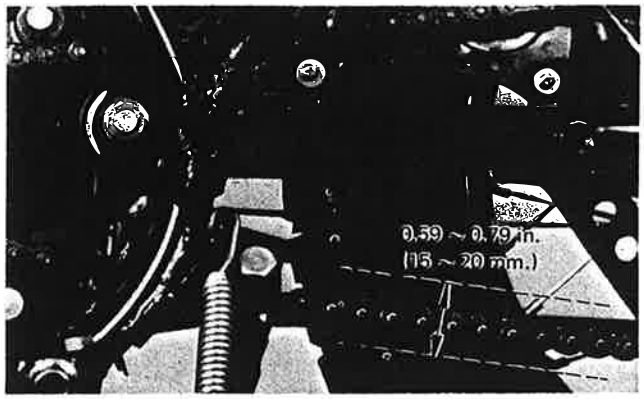
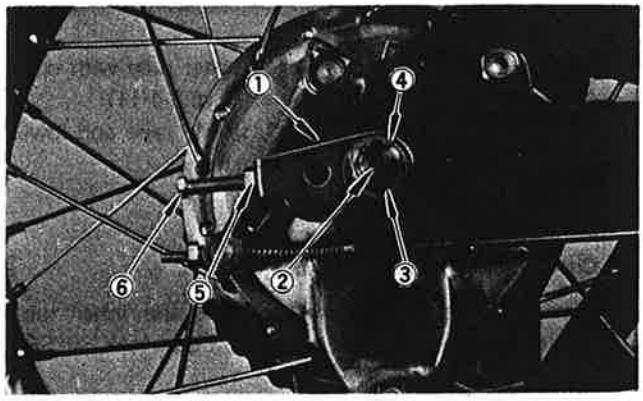


Fig. 2-4-8



1. Position marks
2. Axle shaft
3. Axle nut
4. Cotter pin
5. Locknut
6. Chain puller bolt

Fig. 2-4-9

2. Drive chain maintenance
   The chain should be lubricated per the recommendations given in the Maintenance and Lubrication Interval charts. More often if possible. Preferably after every use.
   a. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
   b. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear.
      Apply thoroughly. Wipe off excess.

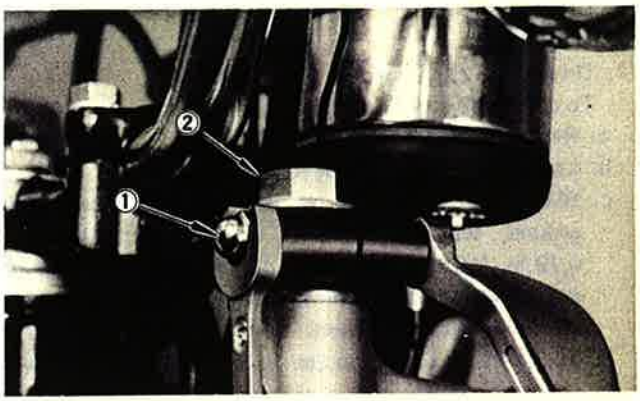
Note:

Choice of lubricant is determined by use and terrain. SAE 20wt. or 30wt. motor oil may be used, but several specialty types by accessory manufacturers offer more penetration and corrosion resistance for roller protection. In certain areas, semi-drying lubricants are preferable. These will resist picking up sand particles, dust, etc.

   c. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
   d. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.

E. Front fork oil change

1. With the front wheel removed or raised off the floor with a suitable frame stand, loosen pinch bolt at the top of each inner fork tube. (Fig. 2-4-10)
2. Remove cap bolts from inner fork tubes.



1. Pinch bolt 2. Cap bolt

Fig. 2-4-10

3. Remove drain screw from each outer tube with open container under each drain hole. (Fig. 2-4-11)
4. After most of oil has drained, slowly raise and lower outer tubes to pump out remaining oil.
5. Replace drain screws.

Note:

Check gaskets, replace if damaged.

6. Pour specified amount of oil into the inner tube through the upper end opening. Use 10W/30"SE" motor oil.

Note:

Specialty type fork oils of quality manufacture may be used. Select the weight oil that suits local conditions and your preference (lighter for less damping; heavier for more damping).

Front fork oil capacity:
5.9 oz. (175 c.c.) per side

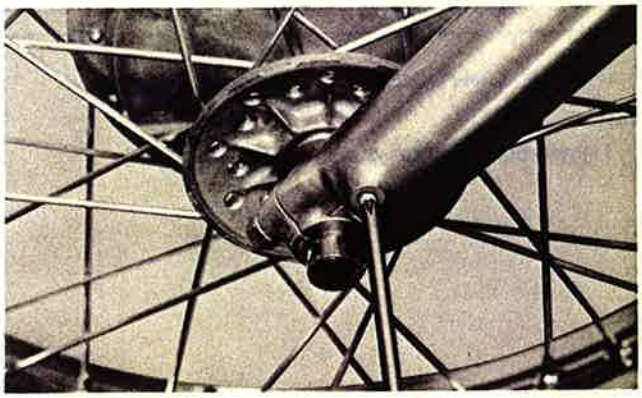


Fig. 2-4-11

7. After filling, slowly pump the outer tubes up and down to distribute the oil.
8. Inspect O-ring on fork cap bolts and replace if damaged. (Fig. 2-4-12)
9. Replace fork cap bolts and torque to specification.

Fork Cap Torque: 900 in-lbs. (10 m-kgs.)

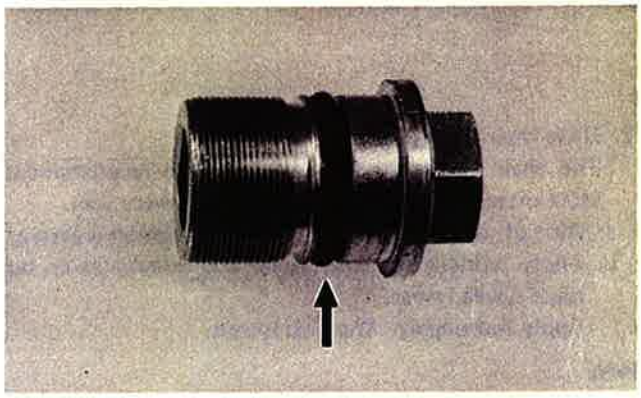


Fig. 2-4-12

10. Tighten pinch bolts at fork crown and torque to specification.

Fork Tube Pinch Bolt Torque: 70 ~ 100 in-lbs. (0.8 ~ 1.2 m-kgs.)

F. Suspension, steering and swing arm

1. Steering head adjustment
   The steering assembly should be checked periodically for any looseness. Do this as follows:
   a. Block machine up so that front wheel is off the ground.
   b. Grasp bottom of forks and gently rock fork assembly backward and forward, checking for any looseness in the steering assembly bearings. (Fig. 2-4-13)

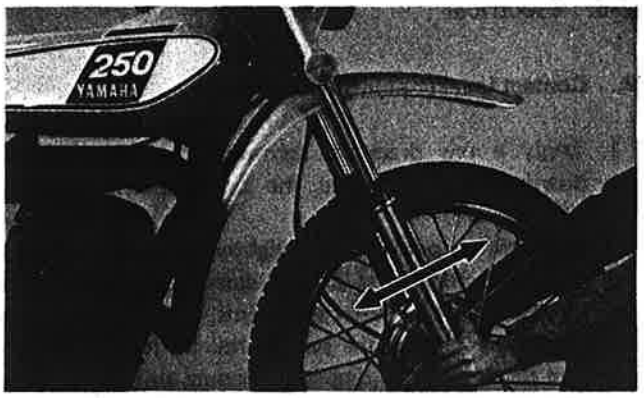
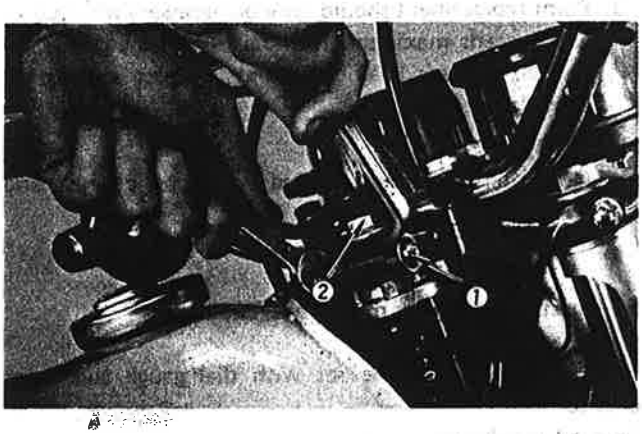


Fig. 2-4-13

   c. If steering head needs adjustment, loosen crown pinch bolt and steering fitting bolt. (Fig. 2-4-14)
   d. Using steering nut wrench, adjust steering head fitting nut until steering head is tight without binding when forks are turned.

Note:
Excessive tightening of this nut will cause rapid wear of ball bearings and races.
Re-check for looseness and freedom of movement.



1. Crown pinch bolt 2. Steering fitting bolt

Fig. 2-4-14

   e. Tighten steering fitting bolt and crown pinch bolt in that order. (Fig. 2-4-15)

Note:
After completing steering adjustment, make certain forks pivot from stop to stop without binding. If binding is noticed, repeat adjustment.

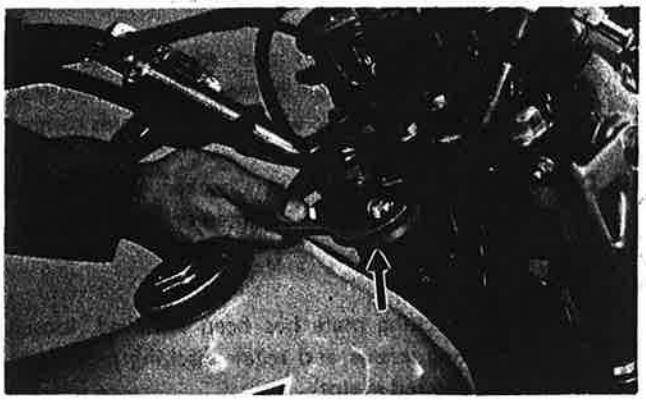


Fig. 2-4-15

2. Suspension
   a. Check all suspension for proper operation.
   b. Check all suspension for proper tightness.
   c. Check rear shocks (R & L) for identical adjustment.
3. Swing Arm
   a. Check for freedom of up and down movement.
   b. Check side to side freeplay.

Swing Arm Freeplay:
0.040 in. (1.0 mm.) at end of swing arm.

   c. Check all securing bolts for proper tightness.
   d. Grease swing arm periodically.

2-5. Electrical

A. Contact breaker points (DT250B)

1. Apply a few drops of light-weight machine oil or distributor lubricant to the point cam lubricator. (Fig. 2-5-1)
2. The ignition points can be lightly sanded with 400 ~ 600 grit sandpaper to remove corrosion. Place a piece of clean paper between the points, let them close, and repeatedly remove the paper until no residue shows. The paper may be dipped in lacquer thinner or point cleaning fluid to remove oil and sanding residue from point surfaces.
3. Point replacement should only be necessary when point gap exceeds maximum tolerance; when the points are severely pitted; or if the points become shorted or show faulty operation.

Note:

New points, when installed, must be cleaned and adjusted.

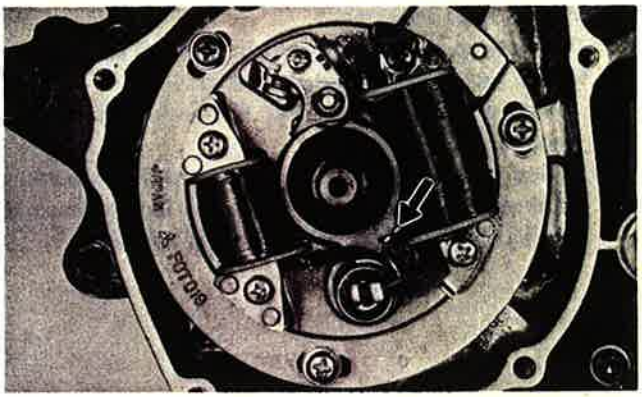


Fig. 2-5-1

B. Ignition timing for magneto (DT250B)

Ignition timing must be set with dial gauge and point checker.

Proceed as follows:

1. Remove spark plug and screw Dial Gauge Stand into spark plug hole.
2. Insert Dial Gauge into stand. (Fig. 2-5-2)
3. Remove left engine crankcase cover.
4. Switch on point checker and adjust. Disconnect magneto harness from main harness. Connect red lead of Point Checker to black wire in wire harness coming from magneto.
5. Connect black lead of Point Checker to unpainted surface of cylinder fin or unpainted crankcase bolt or screw. (Fig. 2-5-3)

Note:

If magneto backing plate has been removed, loosen three mounting screws and rotate backing plate until screws are centered in slots.

6. Rotate magneto flywheel until piston is at top-dead-center. Set the zero on dial gauge face to line up exactly with dial gauge needle. Tighten set screw on spark plug stand to secure dial gauge assembly. Rotate flywheel back and forth to be sure that indicator needle does not go past zero.
7. Starting at T.D.C. rotate flywheel clockwise until dial gauge reads approximately 4 needle revolutions before-top-dead-center (B.T.D.C.).

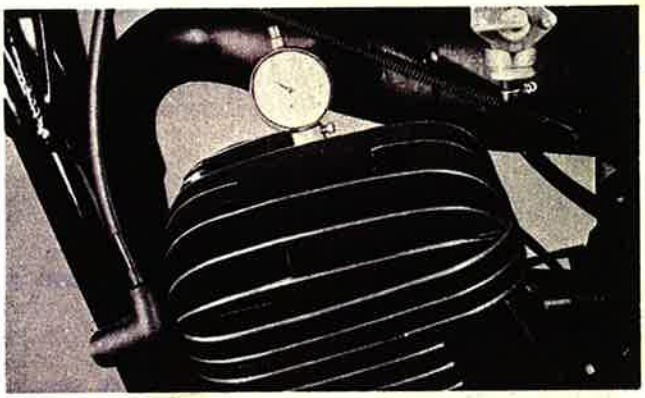


Fig. 2-5-2

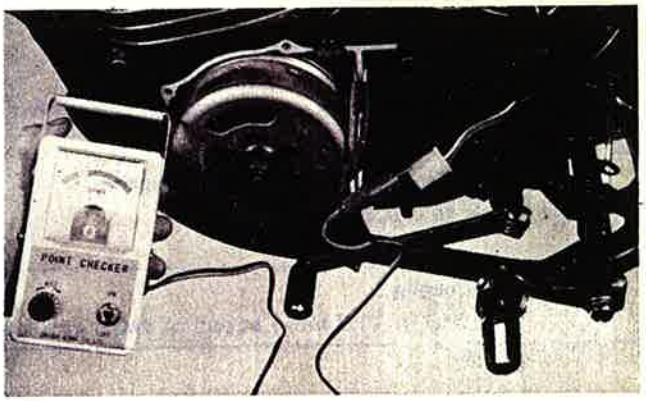


Fig. 2-5-3

8. Slowly turn flywheel counterclockwise until dial gauge reads ignition advance setting listed in Specifications Table. At this time, the point checker needle should swing from "CLOSED" to "OPEN" position, indicating the contact breaker (ignition points) have just begun to open. (Fig. 2-5-4)

Ignition Timing Specifications
Timing (B.T.D.C.): 0.13 ± 0.006 in. (3.2 ± 0.95 mm.)

9. Repeat steps 7. and 8. to verify point opening position. If points do not open within specified tolerance, they must be adjusted.
10. Adjust ignition points by barely loosening Phillips head screw and carefully rotating contact breaker assembly with a slotted screwdriver. Make minor adjustment and retighten Phillips head screw before rechecking timing. Recheck timing by repeating steps 6. and 7.
11. When correct ignition timing has been accomplished, check maximum point gap by turning flywheel until maximum point gap occurs. Measure point gap with thickness gauge. (Fig. 2-5-5)

Point Gap	
Normal:	0.014 in. (0.35 mm.)
Minimum:	0.012 in. (0.30 mm.)
Maximum:	0.016 in. (0.40 mm.)

Note:

If the maximum point gap is over tolerance the contact breaker assembly should be replaced. Do not attempt to bend the fixed point breaker to decrease maximum point gap. This will only result in point misalignment, difficulty in setting timing and premature point failure.

12. Remove dial gauge assembly and stand.
Disconnect point checker. And re-connect magneto wire harness. Replace engine crankcase cover.

C. Ignition timing for C.D.I. (DT400B)

Ignition timing must be set with a dial gauge to determine exact piston position. (Fig. 2-5-6)
Proceed as follows:

1. Follow steps 1 ~ 3, magneto ignition timing procedure.
2. Starting at T.D.C., rotate flywheel clockwise until dial gauge reads approximately 3-1/2 needle revolutions before-to-dead-center.
3. Slowly turn flywheel counterclockwise until dial indicator reads ignition advance setting listed in Specifications Table. At this time, the mark on the flywheel should line up with the mark on the pulser coil assembly.
4. If the marks are not in alignment, loosen the pulser set screws (2) and rotate the pulser until alignment is achieved. Tighten set screws thoroughly. Repeat steps 2. and 3.
5. Remove dial gauge and replace left crankcase cover.

Ignition Timing Specifications:
DT400B 2.9 ± 0.15 mm. B.T.D.C.

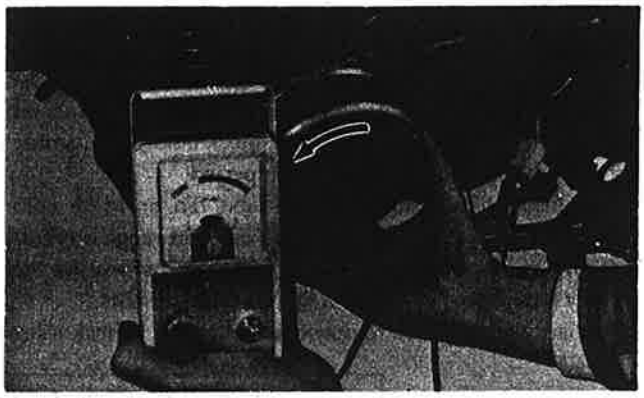


Fig. 2-5-4

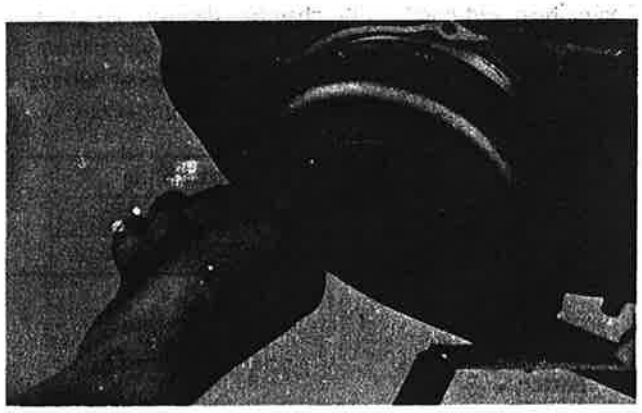
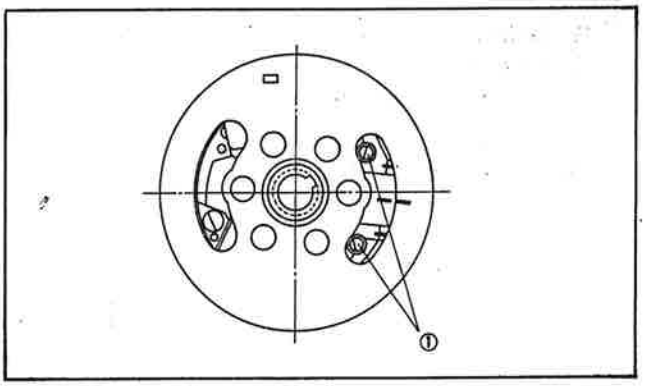


Fig. 2-5-5



1. Pulser set screw

Fig. 2-5-6

D. Spark plug

The spark plug indicates how the engine is operating. If the engine is operating correctly, and the machine is being ridden correctly, then the tip of the white insulator around the positive electrode of the spark plug will be a medium tan color. If the insulator is very dark brown or black color, then a plug with a hotter heat range might be required. This situation is quite common during the engine break-in period.
If the insulator tip shows a very light tan or white color is actually pure white and glazed or if electrodes show signs of melting, then a spark plug with a colder heat range is required.
Remember, the insulator area surrounding the positive electrode of the spark plug must be a medium tan color. If it is not, check carburetion, timing and ignition adjustments.
The spark plug must be removed and checked. Check electrode wear, insulator color, and electrode gap.

Spark Plug Gap: 0.020 ~ 0.024 in. (0.5 ~ 0.6 mm.)

Engine heat and combustion chamber deposits will cause any spark plug to slowly break down and erode. If the electrodes finally become too worn, or if for any reason you believe the spark plug is not functioning correctly, replace it.
When installing the plug, always clean the gasket surface, use a new gasket, wipe off any grime that might be present on the surface of the spark plug, torque the spark plug properly.

Standard Spark Plug	Tightening Torque
DT250B NGK B - 8ES	230 ~ 250 in-lbs. (2.5 ~ 3.0 m-kgs.)
DT400B NGK B - 9ES	

E. Battery

A poorly maintained battery will deteriorate quickly.
The battery fluid should be checked at least once a month.

1. The level should be between the upper and lower level marks. Use only distilled water if refilling is necessary.

Note:
Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.

2. Always make sure the connections are correct when putting the battery back in the motorcycle. The red lead is for the + terminal and the black lead is for the – terminal. Make sure the breather pipe is properly connected and is not damaged or obstructed.

Note:
When filled with diluted sulfuric acid (electrolyte), this battery can be put into use immediately. That is, it is a dry-charged battery. It is advisable, however, that the battery be charged as much as possible before using for the first time for maximum performance. This initial charge will prolong the life of the battery.

Charging current: 0.4A
Charging hours: 10hrs.

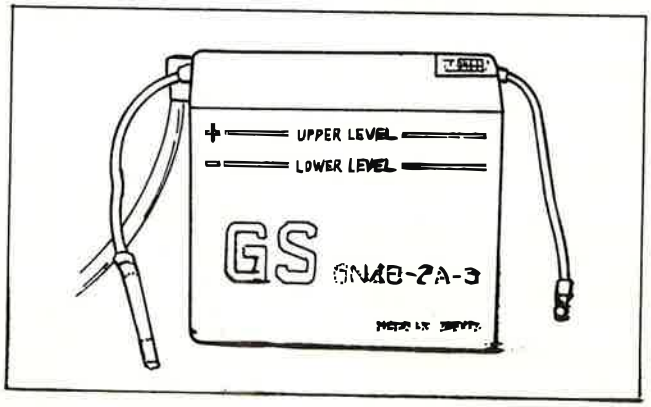


Fig. 2-5-7

F. Headlight

When necessary, adjust the headlight beam as follows.

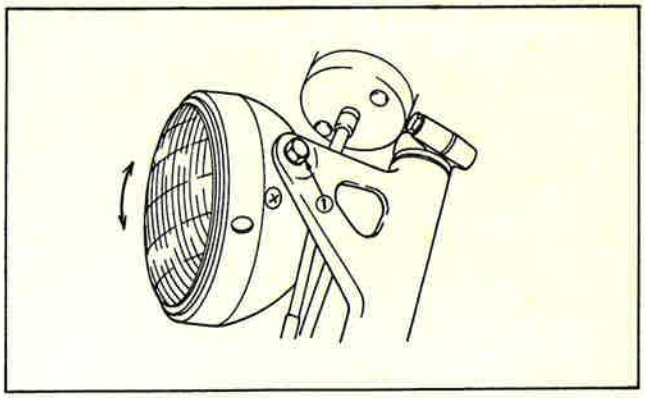
1. Adjust horizontally by tightening or loosening the adjust bolt, as in the illustration. (Fig. 2-5-8)
   To adjust to the right: tighten the screw
   To adjust to the left: loosen the screw
2. Adjust vertically as follows:
   a. Remove the anchor screw holding the headlight rim and remove the rim by prying lightly with a screwdriver at the gap provided at the bottom of the headlight.

Note:
Take care not to damage the headlight.

   b. Slightly loosen the two headlight mounting nuts and refit the rim to the headlight body.

Note:
Do not tighten the anchor screw yet.

   c. Next, adjust vertically by moving the headlight body. When adjustment is complete hold the body in place, remove the rim and tighten the two mounting nuts. Then refit the rim to the headlight body.



1. Bolt

Fig. 2-5-8

Replacing the headlight bulb

When necessary replace the headlight bulb with the specified type as described below.

1. Remove the screws holding the headlight rim and the rim assembly unit.
2. Push the socket in and turn it counterclockwise to remove socket and bulb.
3. Replace the old bulb with a new one.
4. Insert the socket into the lens and install the lens assembly into the headlight body.
5. Secure the headlight rim to the body with the screws.

Note:
Take care not to damage the headlight as it is very fragile.

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CHAPTER 3. ENGINE OVERHAUL

3-1. Removal

A. Preparation for removal

1. All dirt, mud, dust, and foreign material should be thoroughly removed from the exterior of the engine before removal and disassembly. This will prevent any harmful foreign material from entering the interior of the engine assembly.
2. Before engine removal and disassembly, be sure you have proper tools and cleaning equipment so you can perform a clean and efficient job.
3. During disassembly of the engine, clean and place all parts in trays in order of disassembly. This will ease and speed assembly time and insure correct re-installation of all engine parts.
4. Start the engine and warm it for a few minutes; turn off and drain transmission oil.

B. Fuel tank assembly

1. Turn fuel petcock to the "OFF" position and disconnect fuel pipe. Remove the bolt holding the rear of the fuel tank and remove the fuel tank. (Fig. 3-1-1)

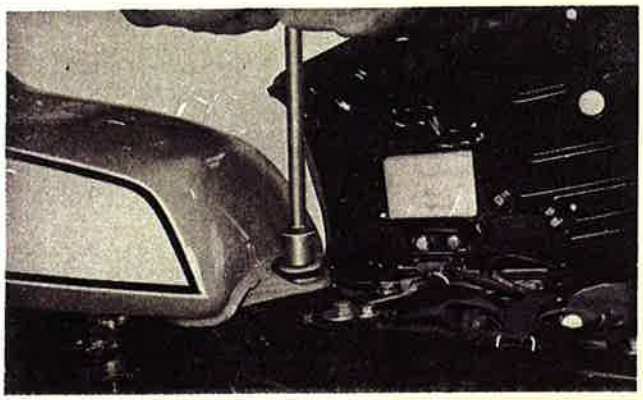


Fig. 3-1-1

2. Lift up rear of tank and slide back. (Fig. 3-1-2)

Fig. 3-1-2

C. Muffler

1. Remove protector. (Fig. 3-1-3)

Fig. 3-1-3

2. Remove the bolt holding the exhaust pipe to the frame. (Fig. 3-1-4)

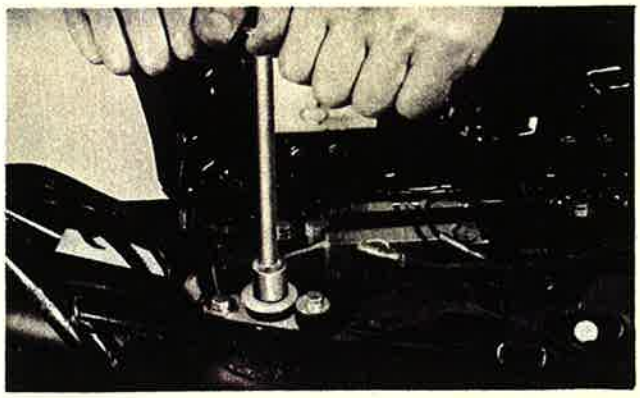


Fig. 3-1-4

3. Remove the bolts holding the exhaust pipe to the cylinder (Fig. 3-1-5)

Fig. 3-1-5

4. Remove exhaust pipe assembly. (Fig. 3-1-6)

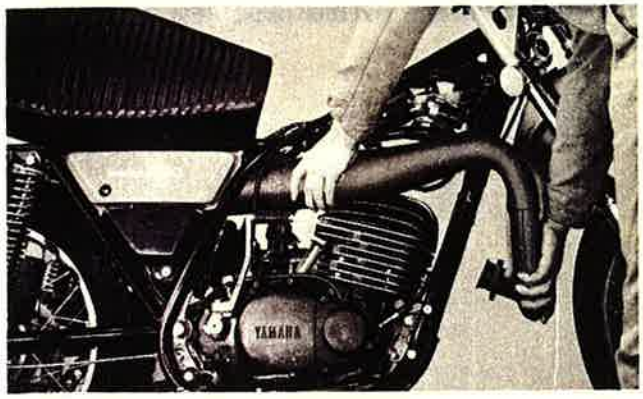


Fig. 3-1-6

D. Wiring and cables

1. Remove spark plug cap.
2. Remove decompression wire (DT400B). (Fig. 3-1-7)

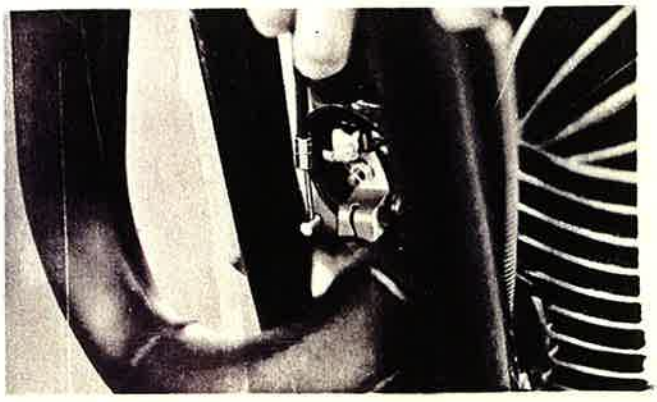


Fig. 3-1-7

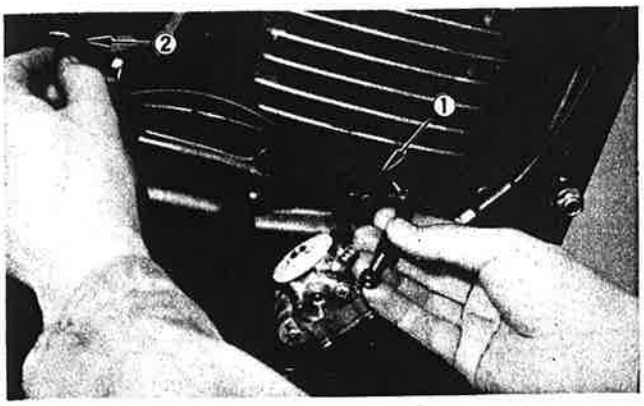
3. Remove oil pump cover. (Fig. 3-1-8)

Fig. 3-1-8

4. Remove oil pipe at oil pump and oil delivery pipe at carburetor. (Fig. 3-1-9)

Note:

Pull oil pipe through oil pipe holder and plug the end so oil will not run out of oil tank.



1. Oil pipe
2. Oil delivery pipe

Fig. 3-1-9

5. Rotate pump pulley to full throttle position and remove wire end from pulley seat. (Fig. 3-1-10)

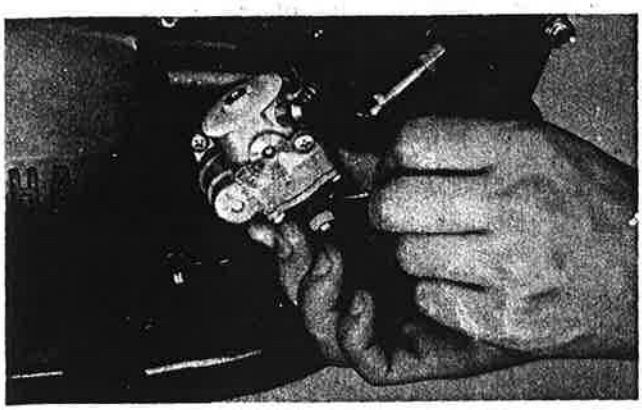


Fig. 3-1-10

6. Loosen wire adjustor lock nut and remove adjustor and wire complete. (Fig. 3-1-11)

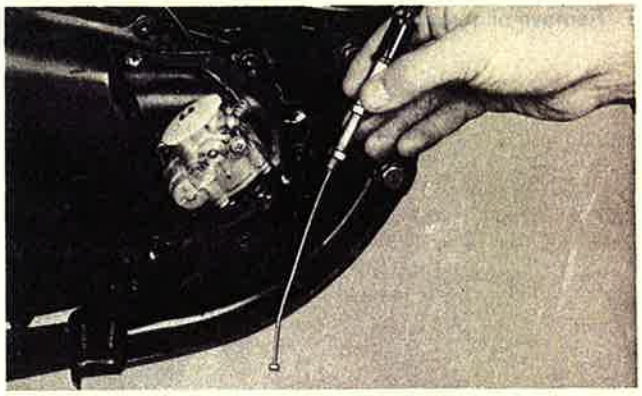


Fig. 3-1-11

7. Remove tachometer cable. (Fig. 3-1-12)

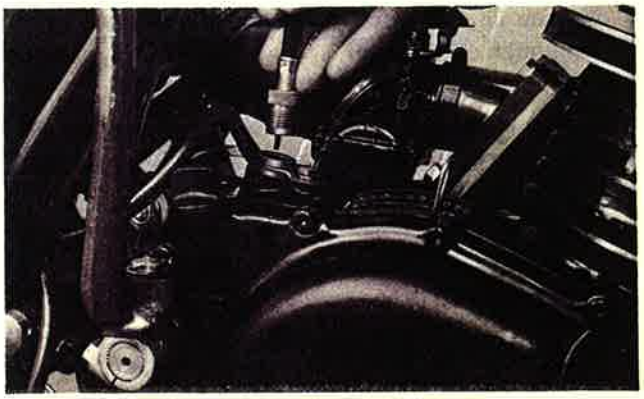


Fig. 3-1-12

8. Remove clutch wire at handle lever first and then at clutch push lever on bottom of engine. (Fig. 3-1-13)

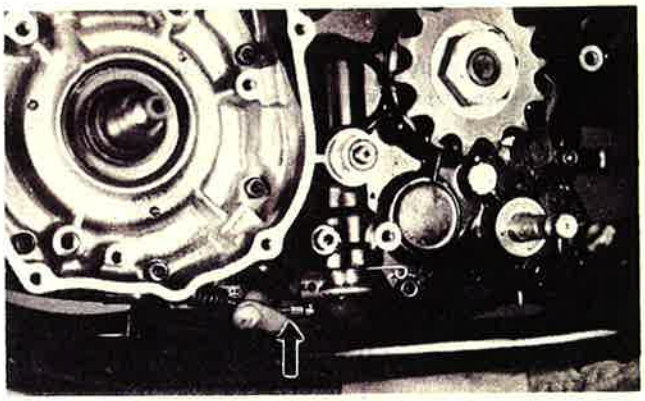


Fig. 3-1-13

E. Carburetor

1. Loosen two carburetor hose clamps. (Fig. 3-1-14)

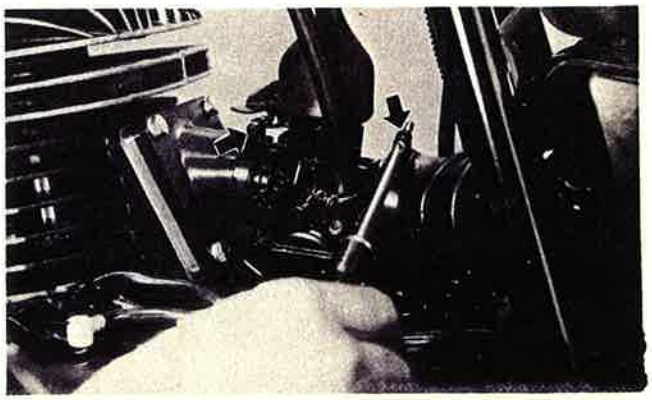


Fig. 3-1-14

2. Push air cleaner joint (hose) off the carburetor inlet and rotate carburetor body to remove carburetor easily.
   Noting the presence, location and routing of all vent and overflow tubes, pull carburetor toward you. (Fig. 3-1-15)

Note:
Remove mixing chamber top and throttle valve assembly.

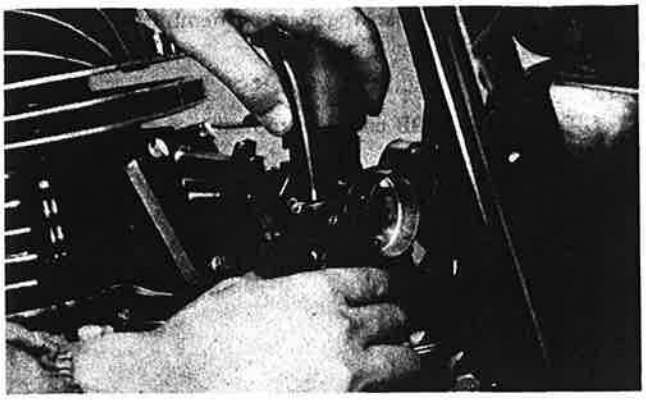


Fig. 3-1-15

F. Change pedal

Completely remove bolt securing change pedal.
Remove change pedal. (Fig. 3-1-16)

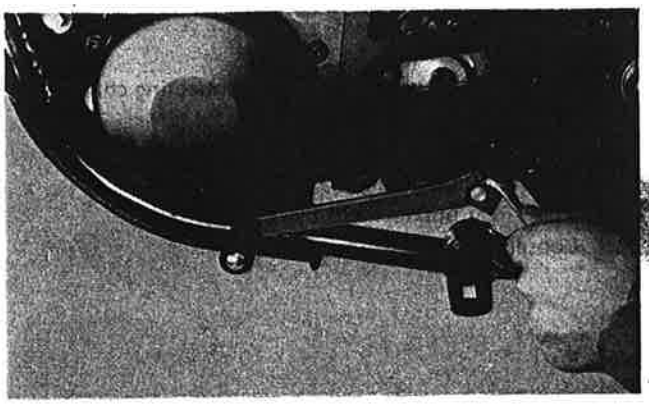


Fig. 3-1-16

G. Flywheel magneto

1. Remove crankcase left cover.
2. Remove flywheel securing nut using magnet holder, note the position and direction of the washers. (Fig. 3-1-17)
3. Install flywheel puller on flywheel and tighten it.

Note:
The puller body has a lefthand thread.

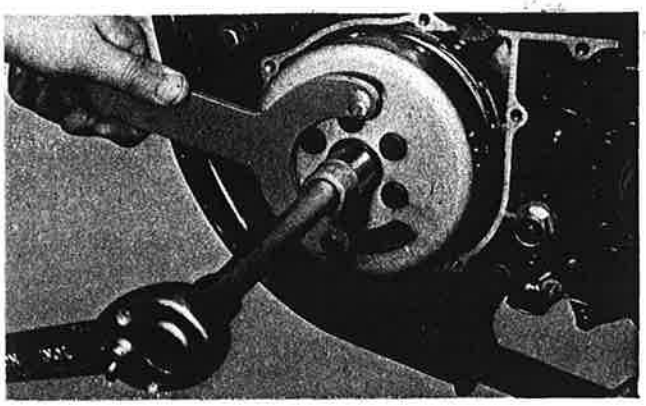


Fig. 3-1-17

4. While holding puller body, tighten push bolt. This will pull flywheel off the tapered end of the crankshaft. (Fig. 3-1-18)
5. Disconnect the magneto lead wires from the main harness at the right, rear frame down tube.

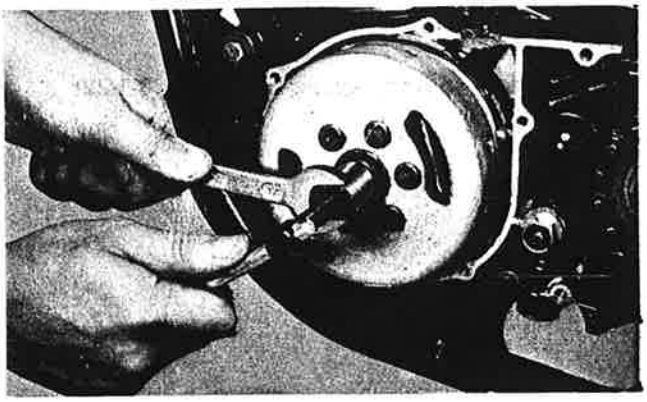


Fig. 3-1-18

6. Remove flywheel backing plate assmembly. (Fig. 3-1-19)

Note:

C.D.I. for DT400B can be removed in a same manner.

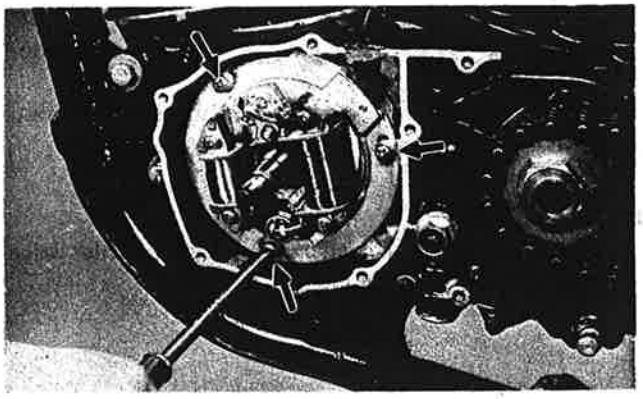


Fig. 3-1-19

H. Drive chain

1. Loosen drive sprocket before disconnecting chain. (Fig. 3-1-20)
   a. Bent down lock tab.
   b. Put transmission in gear.
   c. Apply rear brake.
   d. Loosen sprocket securing nut.

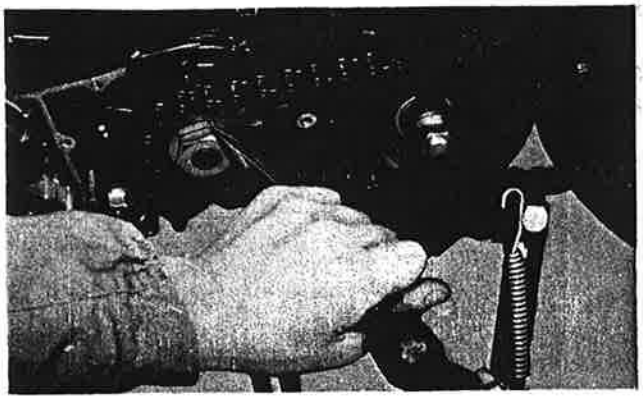


Fig. 3-1-20

2. Remove master link and chain. (Fig. 3-1-21)

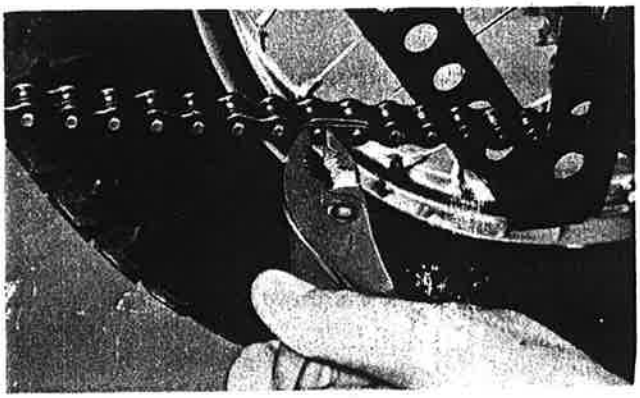


Fig. 3-1-21

I. Removal

1. Remove six engine mounting bolts. (Fig. 3-1-22)

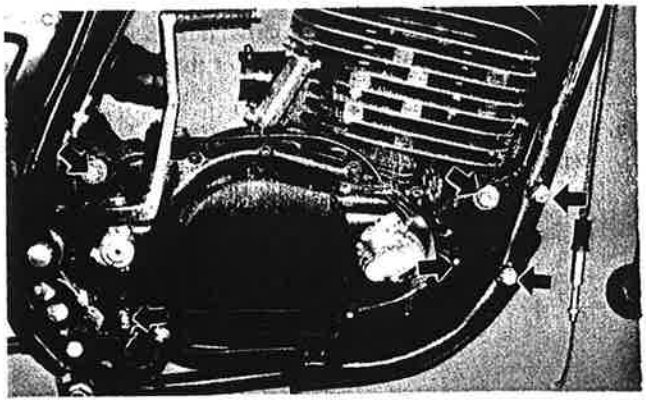


Fig. 3-1-22

2. Remove engine from right side of frame. (Fig. 3-1-23)

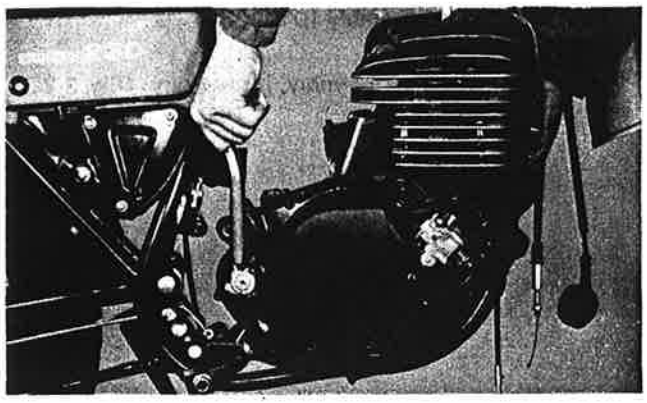


Fig. 3-1-23

3-2. Disassembly

A. Reed valve assembly

Remove reed valve assembly holding bolts (4), carburetor joint and reed valve assembly. (Fig. 3-2-1)

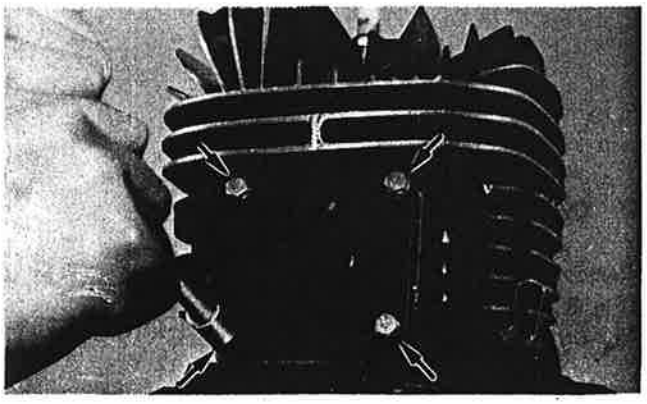


Fig. 3-2-1

B. Cylinder head

Remove cylinder head holding nuts (6) and cylinder head. (Fig. 3-2-2)

Note:

Loosen spark plug before loosening cylinder head.

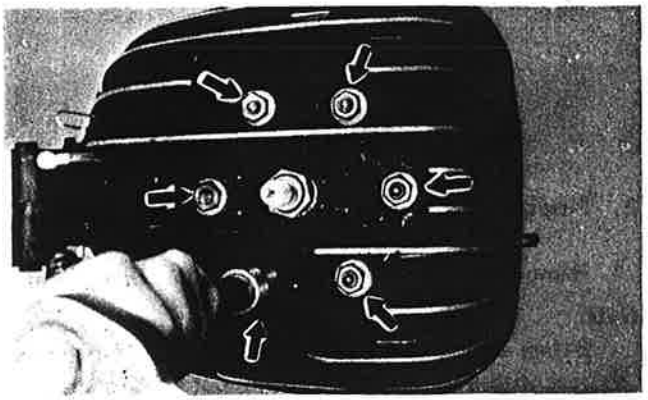
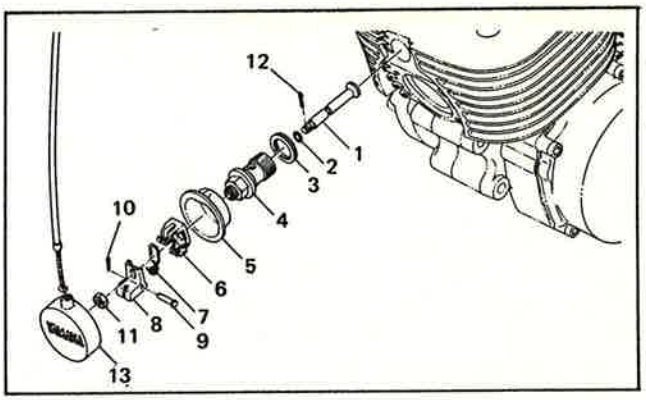


Fig. 3-2-2

C. Decompression assembly (DT400B)

Remove decompression assembly, if necessary. (Fig. 3-2-3)



1. Decompression valve
2. O-ring
3. Gasket
4. Decompression bracket
5. Plate
6. Wire holder
7. Decompression spring
8. Decompression lever
9. Decompression lever pin
10. Cotter pin
11. Nut
12. Cotter pin
13. Decompression cover

Fig. 3-2-3

D. Cylinder

Remove cylinder holding bolts (4) and cylinder (Fig. 3-2-4)

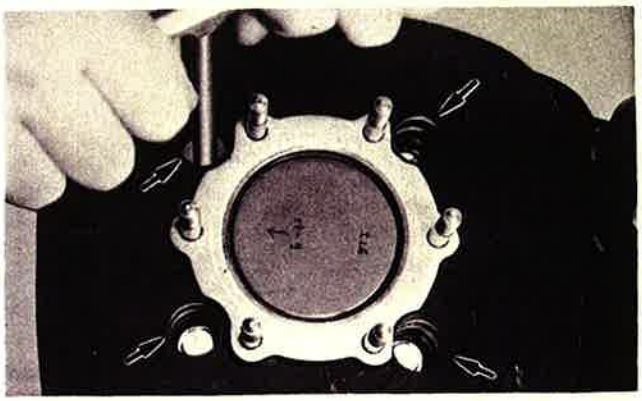


Fig. 3-2-4

E. Piston pin and piston

1. Remove piston pin clip (1) from piston. (Fig. 3-2-5)

Note:

Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.

Fig. 3-2-5

2. Push piston pin from opposite side, then pull out. Protect pin with rag as shown. (Fig. 3-2-6)

Note:

Before removing piston pin, deburr clip groove and pin hole area.

Fig. 3-2-6

F. Kick crank

Remove kick crank securing bolt and kick crank. (Fig. 3-2-7)

Note:

The bolt must be completely removed from the kick crank.

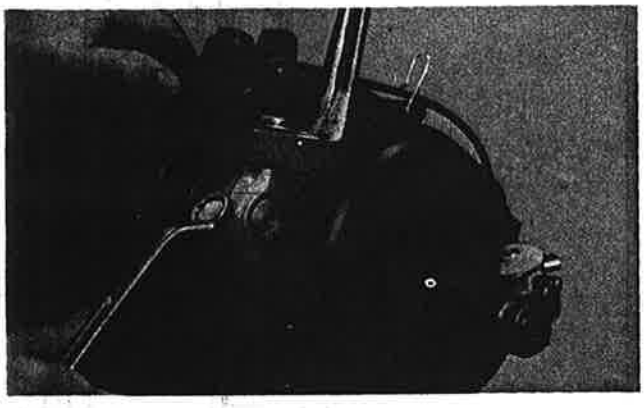


Fig. 3-2-7

G. Crankcase cover, right

Remove crankcase cover (right) holding bolts (12) and the cover. (Fig. 3-2-8)

Note:

Crankcase cover can be removed without removing Autolube pump. (See 3-3-9 Autolube pump).

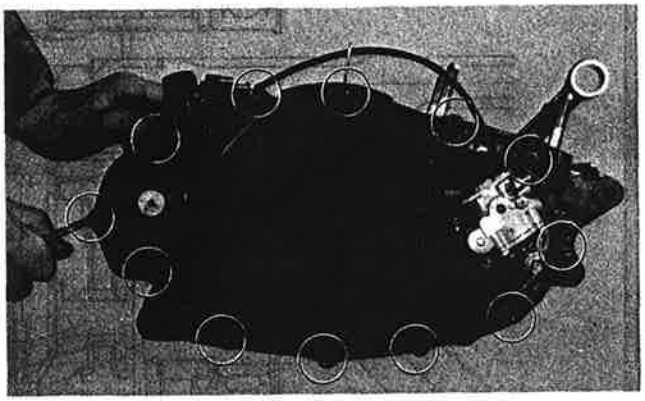


Fig. 3-2-8

H. Clutch assembly and primary drive gear

1. Remove six clutch spring holding screws, pressure plate, clutch plates, friction plates, push rod 1 and ball. (Fig. 3-2-9)

Note:

Directly behind ball is push rod 2. It cannot be removed from the clutch side. This push rod must be removed after disassembling transmission.

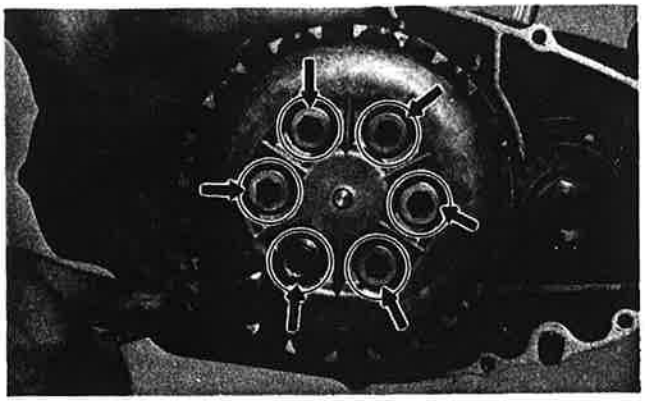
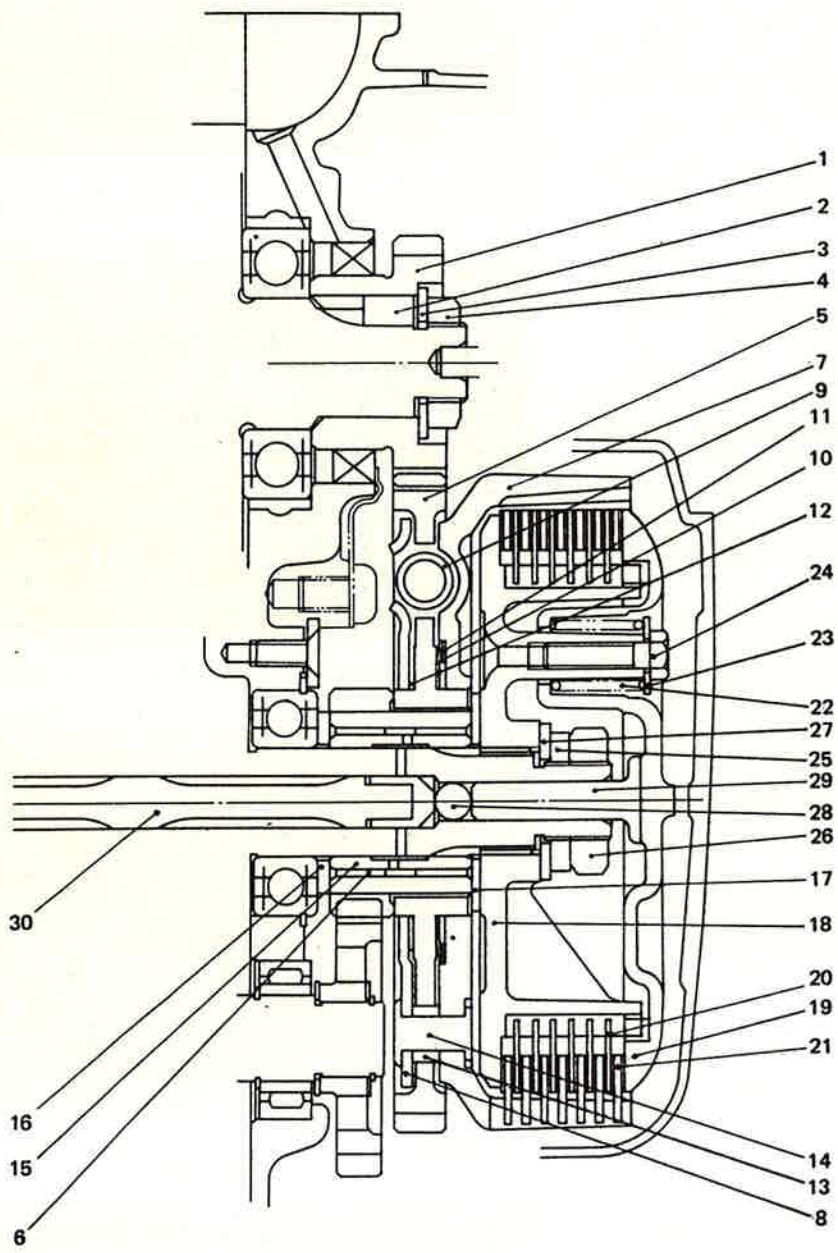


Fig. 3-2-9



1. Primary drive gear
2. Straight key
3. Belleville spring
4. Nut
5. Primary driven gear
6. Bushing
7. Clutch housing
8. Side plate
9. Absorber 2
10. Belleville spring
11. Receive plate
12. Thrust plate
13. Collar
14. Rivet
15. Spacer
16. Thrust plate
17. Thrust plate 2
18. Clutch boss
19. Pressure plate
20. Clutch plate
21. Friction plate
22. Clutch spring
23. Washer
24. Hexagon screw
25. Spring washer
26. Locknut
27. Plain washer
28. Ball
29. Push rod
30. Push rod

Fig. 3-2-10

2. Install clutch holding tool on clutch boss. Remove lock nut, washers, in that order. (Fig. 3-2-11)

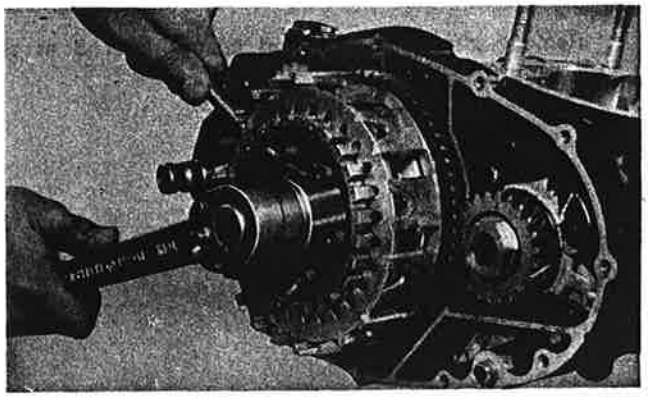


Fig. 3-2-11

3. Loosen primary drive gear by first placing a folded rag (at least 16 layers) between the teeth of the primary gears to lock them as shown in the figure. Then loosen drive gear nut. Remove nut & washer. (Fig. 3-2-12)
4. Remove driven gear assembly, primary drive gear, crankshaft oil seal retainers, and tachometer drive gear.

Note:

A universal gear puller may be needed to remove primary drive gear from crankshaft. If driven gear spacing collar and spacing washer remain on the shaft, remove at this time.

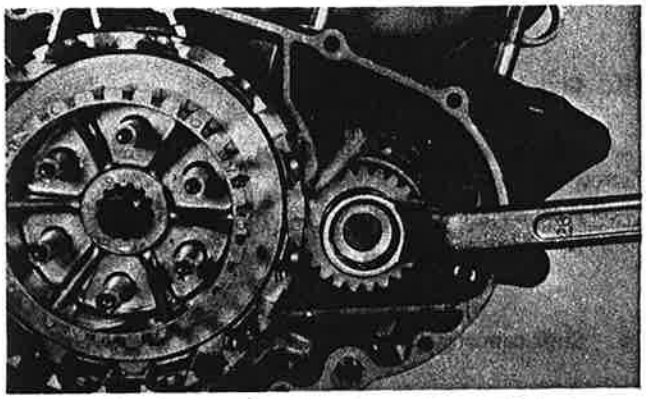


Fig. 3-2-12

I. Kick axle assembly

Install kick crank on kick axle. Rotate kick axle counter-clockwise approximately 1/8 turn and pull straight out. (Fig. 3-2-13)

Note:

Decompresson wire must be removed, prior to remove kick axle. (DT400B)

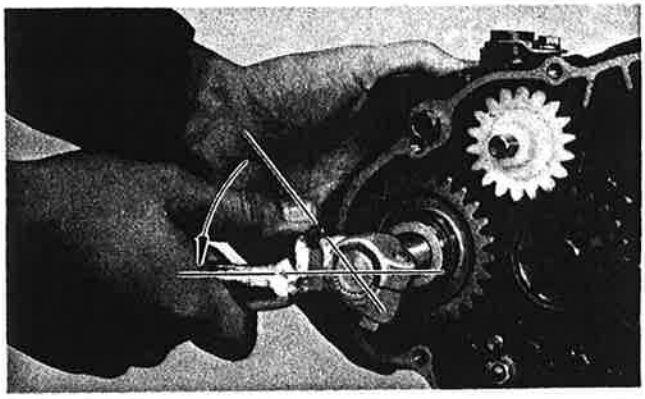


Fig. 3-2-13

J. Change shaft assembly

Remove circlip from left side of change shaft and pull shaft and shift lever 1 out from the right hand side. (Fig. 3-2-14)

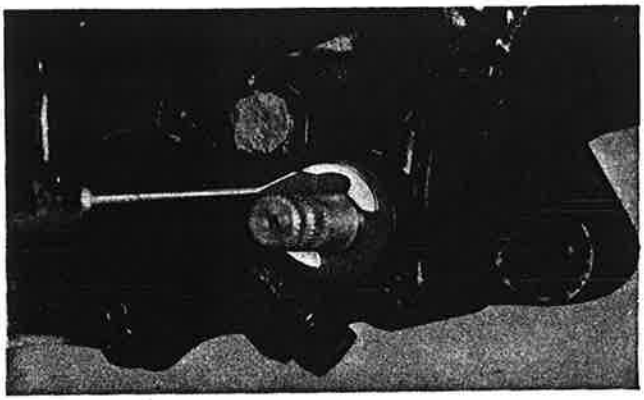


Fig. 3-2-14

Note:

Remove change lever 2 and change lever 3 as an assembly. (Fig. 3-2-15)

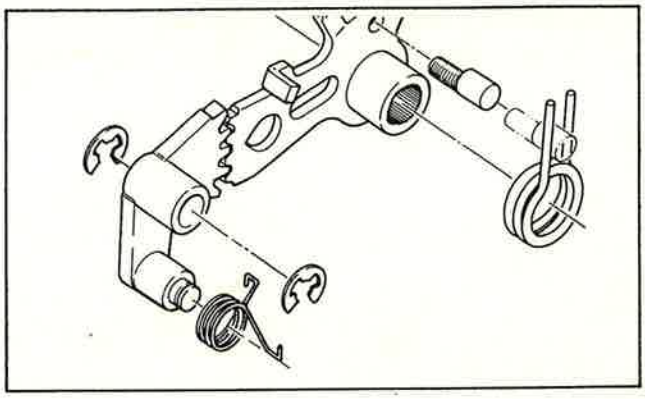


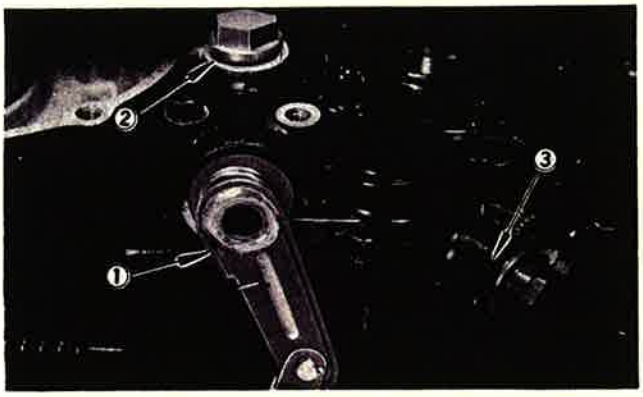
Fig. 3-2-15

K. Clutch push lever axle

Loosen adjusting screw lock nut and remove adjusting screw.
Pull push lever axle down to remove. (Fig. 3-2-16) (Fig. 3-2-17)

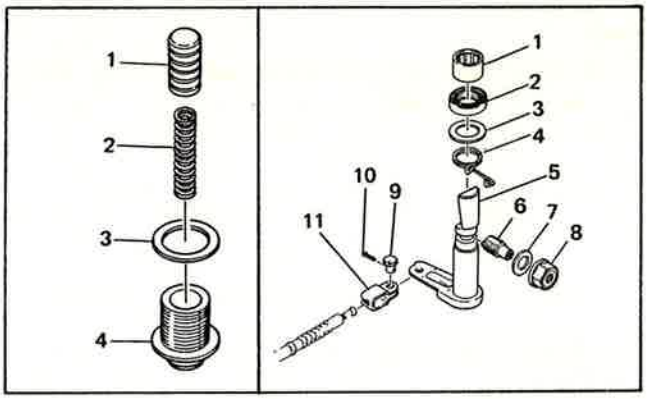
L. Shift cam stopper

Remove bolt, spring and stopper. (Fig. 3-2-16) (Fig. 3-2-17)



1. Clutch push lever axle
2. Adjusting screw
3. Shift cam stopper

Fig. 3-2-16



1. Cam stopper
2. Cam stopper spring
3. Drain plug gasket
4. Spring screw

1. Bearing
2. Oil seal
3. Plate washer
4. Return spring
5. Push lever axle
6. Adjusting screw
7. Gasket
8. Adjusting nut
9. Pin
10. Cotter pin
11. Joint

Fig. 3-2-17

1. Working in a crisscross pattern, loosen 14 hexagon bolts 1/4 turn each. Remove them after all are loosened. (Fig. 3-2-18)

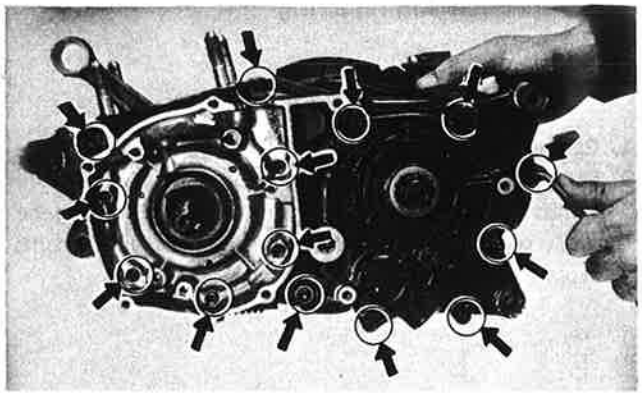


Fig. 3-2-18

2. Install crankcase separating tool as shown. Use a thick plain washer to protect end of crankshaft. (Fig. 3-2-19)

Note:

Fully tighten the tool securing bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.

3. As pressure is applied, alternately tap on the front engine mounting boss, the transmission shafts and the shift drum. (Fig. 3-2-19)

Caution:

Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up", take pressure off the push screw, realign and start over. If the halves are reluctant to separate, check for a remaining case screw or fitting. Do not force.

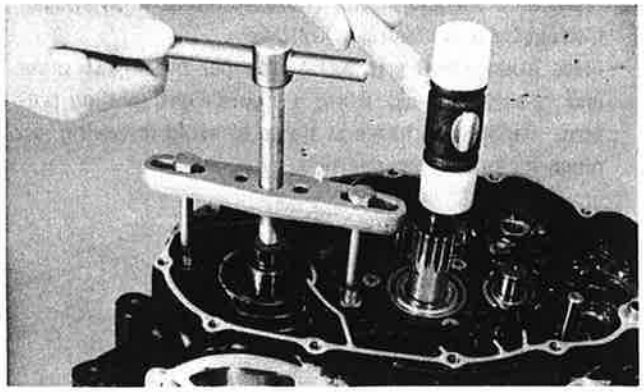


Fig. 3-2-19

N. Transmission

Transmission shafts, shift forks and shift cam should be removed as an assembly. Tap lightly on the transmission drive shaft with a soft hammer to remove. (Fig. 3-2-20)

Note:

Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.

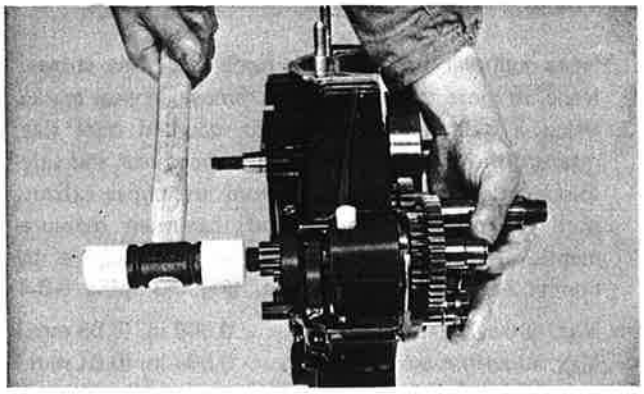


Fig. 3-2-20

O. Crankshaft

Remove crankshaft assembly with the crankcase separating tool. (Fig. 3-2-21)

Note:

Note the thrust shim position, if any.

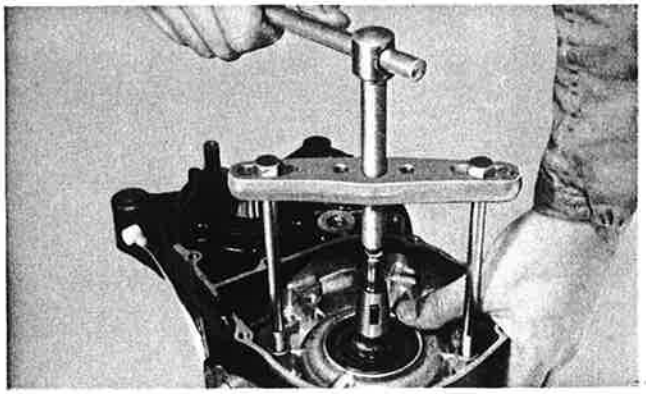


Fig. 3-2-21

3-3. Inspection and repairing

A. Cylinder head

1. Remove spark plug.
2. Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging the spark plug threads. Do not use a sharp instrument; avoid scratching aluminum. (Fig. 3-3-1)

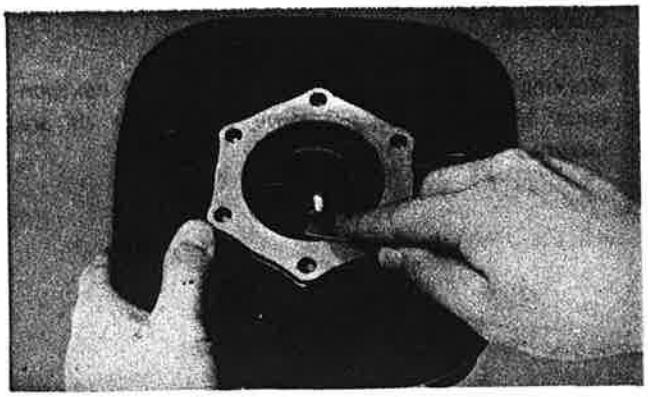


Fig. 3-3-1

3. Place on a surface plate. There should be no warpage. Correct by re-surfacing as follows:
   Place 400 ~ 600 grit wet sandpaper on surface plate and re-surface head using a figure-eight sanding pattern. Rotate head several times to avoid removing too much material from one side. (Fig. 3-3-2)

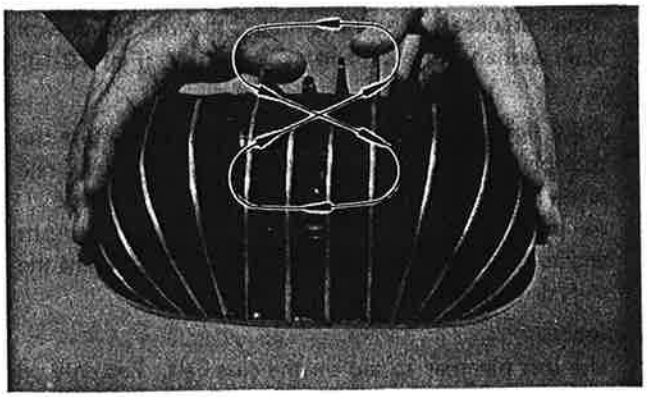


Fig. 3-3-2

B. Cylinder

1. Hone cylinder bore using a hone with fine stones. Hone no more than required to remove all wear marks.
2. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure front-to-rear and side-to-side at top, center and bottom just above exhaust port. Compare minimum and maximum measurements. If over tolerance and not correctable by honing, rebore to next over-size. (Fig. 3-3-3, Fig. 3-3-4)

   Max. allowable taper . . . . . 0.002 in. (0.05 mm.)
   Max. allowable out-of-round . . . 0.004 in. (0.01 mm.)

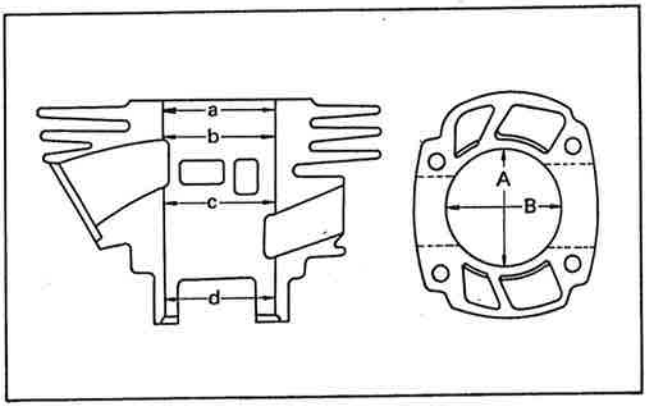


Fig. 3-3-3

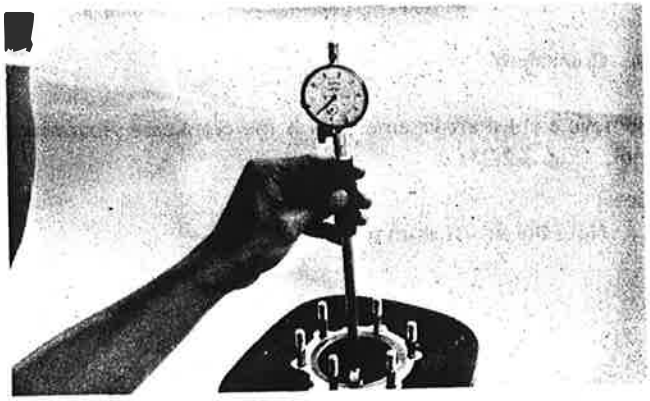


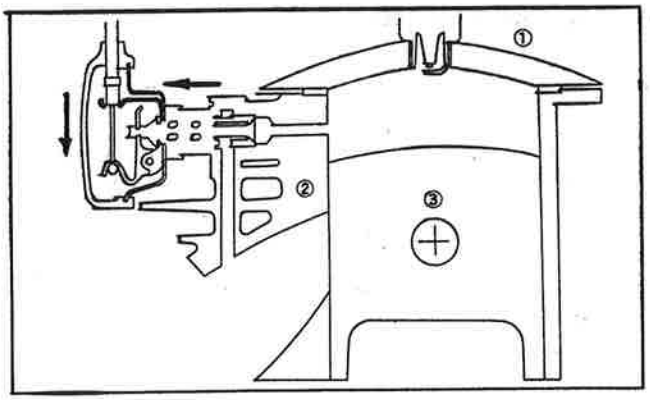
Fig. 3-3-4

C. Decompression device (DT400B)

A decompression device is used on the 400 c.c. engine. It is so designed to engage automatically when the kick lever is engaged.

1. Construction

   With the decompression lever actuated, a portion of the compressed air-fuel mixture and burned gases in the cylinder are forced out through the decompression port in the cylinder and routed to the exhaust port. This effectively reduces compression pressure and eases engine starting. (Fig. 3-3-5) (Fig. 3-3-6)



1. Cylinder head 2. Cylinder 3. Piston

Fig. 3-3-5

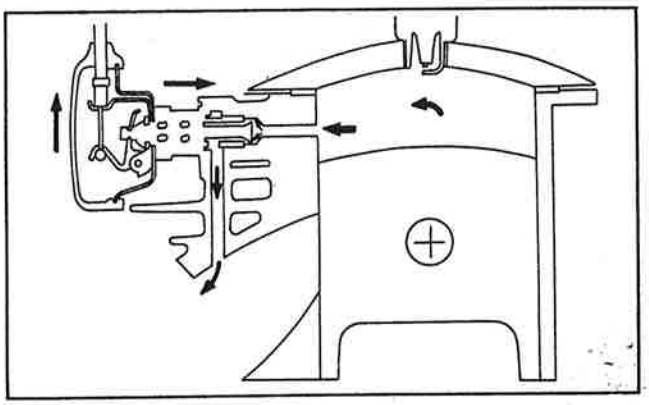


Fig. 3-3-6

2. Carbon removal

   Remove the decompression holder (screw-in type, see Fig. 3-2-3) and remove any deposits from the decompression valve, decompression holder and passages. (Fig. 3-3-7) (Fig. 3-3-8)

Note:

It is always advisable, when the decompression device is excessively worn or leaking badly, both valve and holder should be replaced.

Caution:

After reassembling the decompression device, be sure to check it for compression pressure leaks.

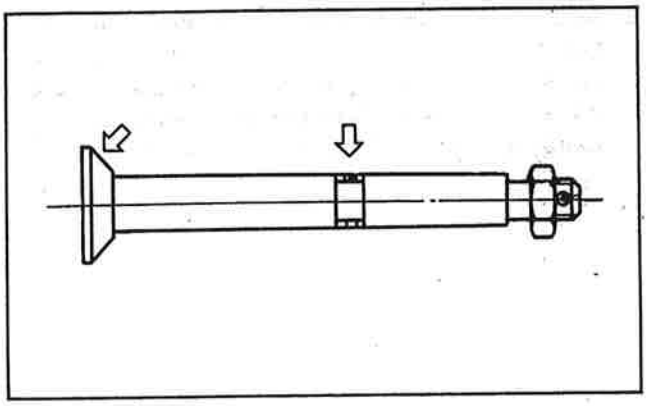


Fig. 3-3-7

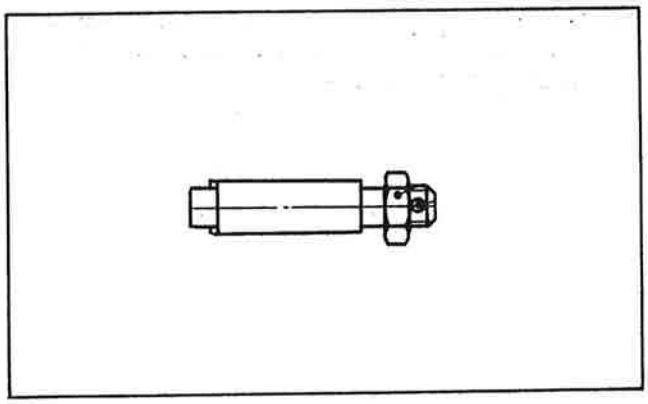


Fig. 3-3-8

D. Piston pin and bearing

1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing. (Fig. 3-3-9)
2. Check the pin and bearing for signs of heat discoloration. If excessive (heavily blued), replace both. (Fig. 3-3-9)

Note:

Shiny spots on pin from race wear are normal. Replace pin and bearing only if wear is excessive (indentation on pin, etc.).

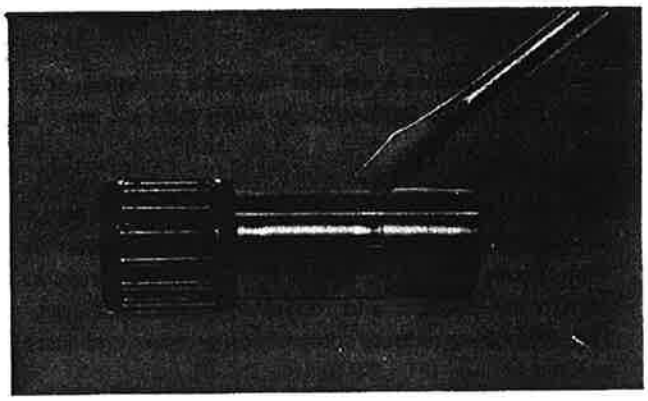


Fig. 3-3-9

3. Check the bearing cage for excessive wear or damage. Check the rollers for signs of flat spots. If found replace pin and bearing. (Fig. 3-3-10)

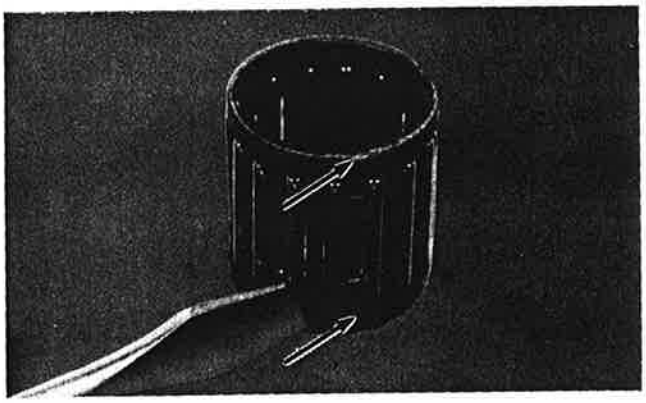


Fig. 3-3-10

4. Apply a light film of oil to pin and bearing surfaces. Install in connecting rod small end. Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end for wear. Replace pin and bearing or all as required. (Fig. 3-3-11)

Fig. 3-3-11

5. The piston pin should have no noticeable freeplay in piston. If the piston pin is loose, replace the pin and/or the piston. (Fig. 3-3-12)

Fig. 3-3-12

E. Piston

1. Remove piston ring. (Fig. 3-3-13)

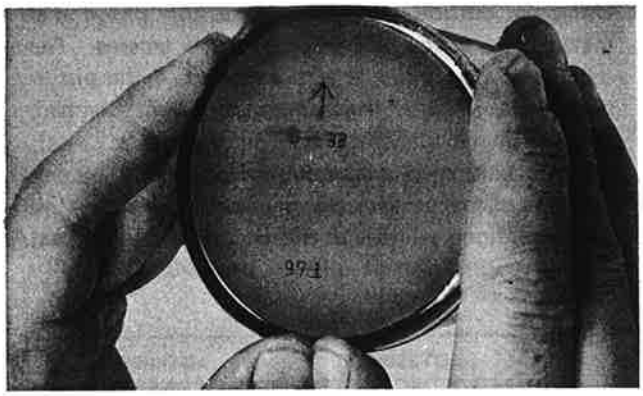


Fig. 3-3-13

2. Remove carbon deposits from piston crown. (Fig. 3-3-14)

Fig. 3-3-14

3. Remove carbon deposits from ring grooves. (Fig. 3-3-15)

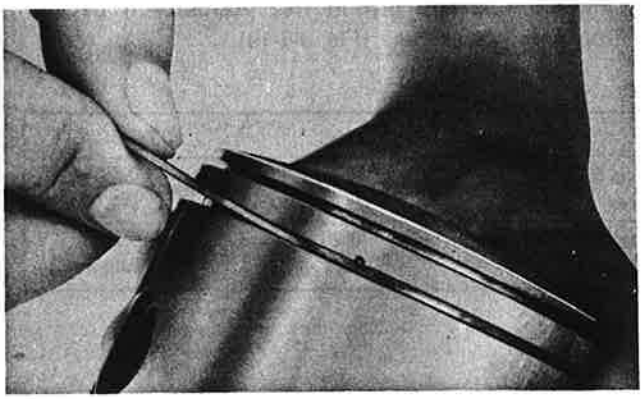


Fig. 3-3-15

4. Remove score marks and lacquer deposits from sides of piston using 400 ~ 600 grit wet sandpaper. Sand in a cross-hatch pattern. Do not sand excessively. (Fig. 3-3-16)
5. Wash piston in solvent and wipe dry.

Fig. 3-3-16

6. Using an outside micrometer, measure piston diameter. The piston is cam-ground and tapered. The only measuring point is at right angles to the piston pin holes about 1/2" from bottom of piston. Compare piston diameter to cylinder bore measurements. Piston maximum diameter subtracted from minimum cylinder diameter gives piston clearance. If beyond tolerance, hone cylinder to tolerance or re-bore to next over-size and fit over-size piston. (Fig. 3-3-17)

	DT250B		DT400B	
	Min.	Max.	Min.	Max.
Piston Clearance	0.0016 in. (0.040 mm.)	0.0018 in. (0.045 mm.)	0.0018 in. (0.045 mm.)	0.0020 in. (0.050 mm.)
Maximum Wear Limit	0.004 in. (0.1 mm.)		0.004 in. (0.1 mm.)	

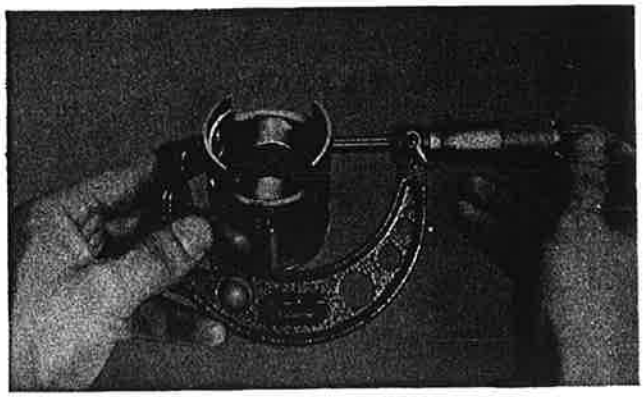


Fig. 3-3-17

F. Piston rings

The L Type Keystone Ring is installed in the top ring groove as illustrated. The ring provides increased output through better combustion pressure sealing. The taper of 7° on the bottom of the ring aids in increased sealing and prevents sticking. (Fig. 3-3-18)

1. Check rings for scoring. If any severe scratches are noticed, replace set.

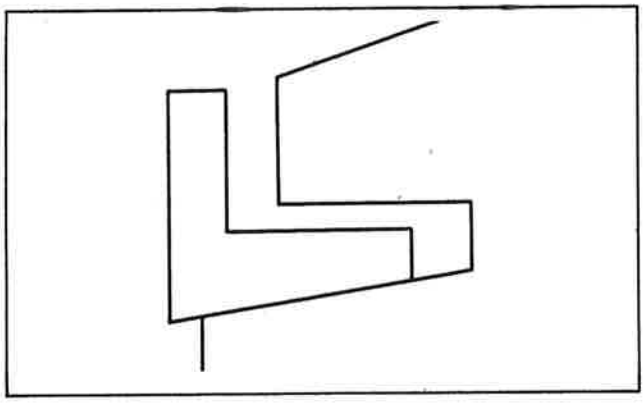


Fig. 3-3-18

2. Measure ring end gap in free position. If beyond tolerance, replace set. (Fig. 3-3-19)

	DT250B	DT400B
Top Ring End Gap, Free	Approx. 0.22 in. (5.5 mm.)	Approx. 0.44 in. (11.0 mm.)
2nd Ring End Gap, Free	Approx. 0.28 in. (5.5 mm.)	Approx. 0.20 in. (5.0 mm.)

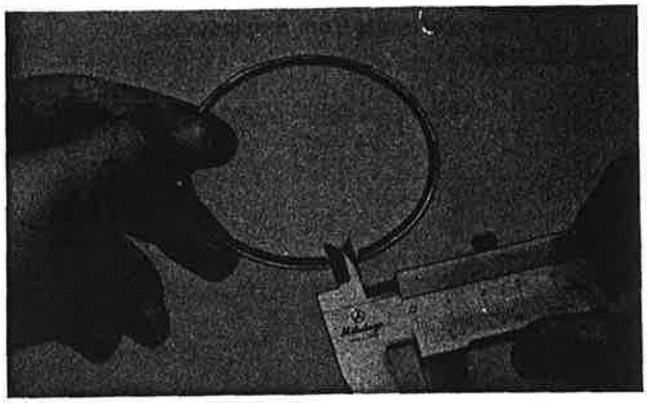


Fig. 3-3-19

3. Insert each ring into cylinder. Push down approximately 3/4" using piston crown to maintain right-angle to bore. Measure installed end gap. If beyond tolerance, replace set. (Fig. 3-3-20)

	DT250B		DT400B	
	Min.	Max.	Min.	Max.
Top Ring End Gap, Installed	0.008 in. (0.20 mm.)	0.016 in. (0.40 mm.)	0.012 in. (0.30 mm.)	0.020 in. (0.50 mm.)
2nd Ring End Gap, Installed	0.008 in. (0.20 mm.)	0.016 in. (0.40 mm.)	0.012 in. (0.30 mm.)	0.020 in. (0.50 mm.)

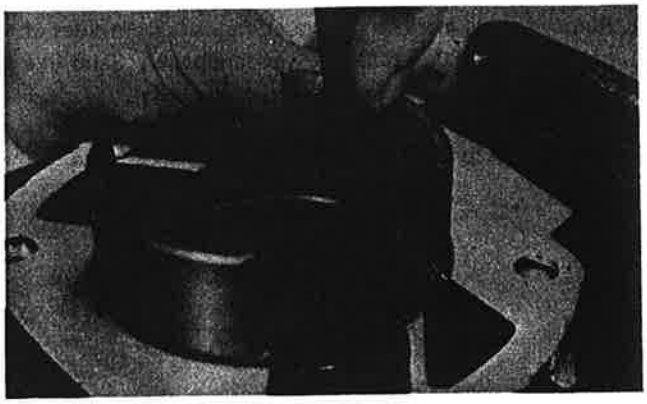


Fig. 3-3-20

4. With rings installed in grooves, insert feeler gauge between ring side and groove. If beyond tolerance, replace ring and/or piston as required. (Fig. 3-3-21)

	DT250B/DT400B	
	Max.	Min.
2nd Ring Groove, Clearance	0.0012 in. (0.03 mm.)	0.0032 in. (0.08 mm.)

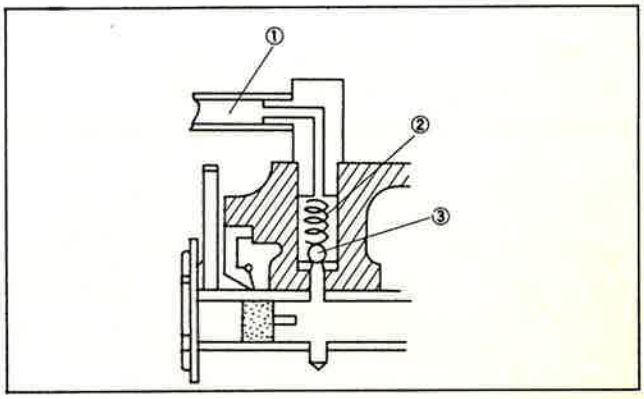
5. Check ring expander. If worn excessively, or broken, replace ring set.

Fig. 3-3-21

G. Autolube pump

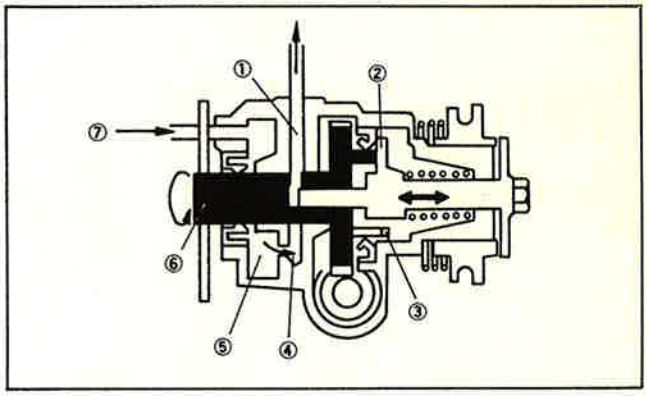
The Yamaha Autolube Pump is a sealed unit. Its output has been checked and adjusted at the factory. Except for the components shown in the illustration (Fig. 3-3-32), no further disassembly of the pump should be attempted.
The adjustments and servicing of the Autolube pump are covered in 2-3-C.

1. Description of operation.
   a. The pump is driven directly off the crankshaft. Its output is controlled by the throttle-grip setting and the engine r.p.m.
   b. Oil flow to the pump from the Autolube reservoir tank is via gravity feed.
   c. Oil flow from the pump to the cylinder is via rubber tubing. Oil is delivered directly into the intake port where it is picked-up by the carburetor air stream for delivery to the bottom end and cylinder walls.
   d. A spring-loaded check ball at the delivery line junction prevents backflow to the pump when the engine is not running. (Fig. 3-3-22)



1. Delivery pipe 2. Check-ball spring 3. Check-ball

Fig. 3-3-22



1. Outlet
2. Guide pin
3. Cam
4. Inlet
5. Oil chamber
6. Distributor
7. Oil

Fig. 3-3-23

2. Removal and disassembly

a. Remove (two) phillips screws securing pump to crankcase cover. Remove pump. (Fig. 3-3-24)

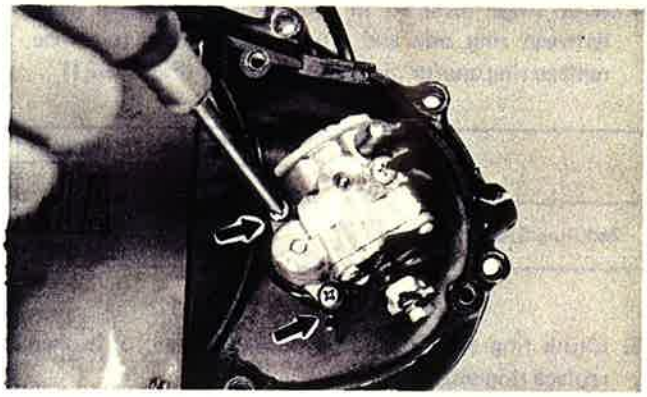
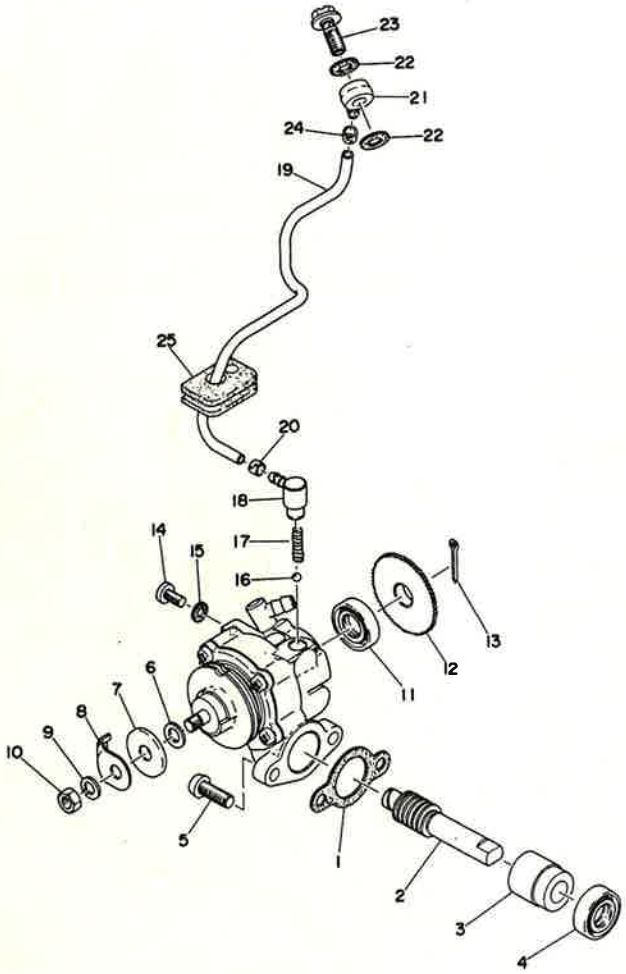


Fig. 3-3-24

b. Disassembly is straightforward and can be accomplished by the parts illustration. (Fig. 3-3-25)

Oil Pump



1. Pump case gasket
2. Worm shaft
3. Worm shaft outer metal
4. Oil seal
5. Pan head screw
6. Plunger shim
7. Adjusting plate
8 Cover
9. Spring washer
10. Nut
11. Oil seal
12. Starter plate
13. Cotter pin
14. Bind screw
15. Breather gasket
16. Ball (5/32 inch)
17. Check ball spring
18. Nozzle
19. Delivery pipe
20. Delivery pipe clip
21. Delivery pipe banjo
22. Banjo bolt gasket
23. Banjo bolt
24. Delivery pipe clip
25. Oil pipe holder

Fig. 3-3-25

3. Troubleshooting and repair

a. Wear or an internal malfunction may cause pump output to vary from the factory setting. This situation is, however, extremely rare. If output is suspect, check the following:

1) Obstructions in delivery line to pump or from pump to cylinder.
2) Worn or damaged pump body seal or crankcase cover seal.
3) Missing or improperly installed check ball or spring.
4) Improperly installed or routed oil delivery line(s).
5) Loose fitting(s) allowing air entry to pump and/or engine.

b. If all inspections show no obvious problems and output is still suspect, connect a delivery line from the pump to a graduated container (c.c.). Keep the delivery line short. Rotate the pump bleed wheel while counting pump plunger strokes. If output is not to specification, replace pump assembly.

Autolube Pump Specifications

Pump Output @200 Strokes	Maximum Throttle		Minimum Throttle	
	Min.	Max.	Min.	Max.
DT250B/DT400B	8.8 c.c.	9.7 c.c.	0.95 c.c.	1.2 c.c.

Pump Stroke Length	Maximum Throttle		Minimum Throttle	
	Min.	Max.	Min.	Max.
DT250B/DT400B	0.074 in. (1.85 mm.)	0.082 in. (2.05 mm.)	0.008 in. (0.20 mm)	0.010 in. (0.25 mm.)

4. Reassembly

Always install a new pump case gasket.

H. Clutch

1. Measure the friction plates at three or four points. If their minimum thickness exceeds tolerance, replace. (Fig. 3-3-26)

	New	Wear Limit
Friction Plate Thickness:	0.12 in. (3.0 mm.)	0.11 in. (2.7 mm.)

2. Check the friction plate for signs of warpage and heat damage, replace as required.

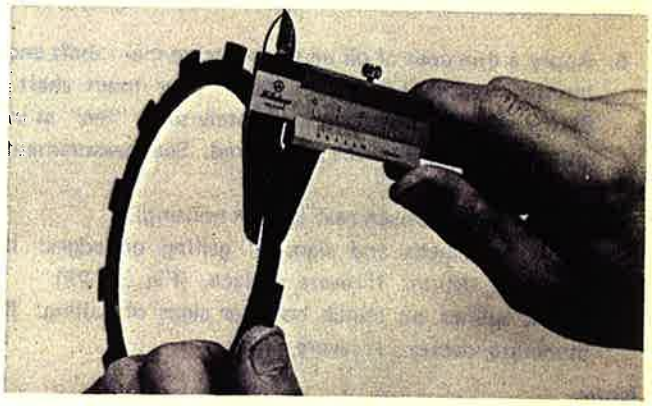


Fig. 3-3-26

3. Check each clutch plate for signs of heat damage and warpage. Place on surface plate (Plate glass is acceptable) and use feeler gauge as illustrated. If warpage exceeds tolerance, replace. (Fig. 3-3-27)

Clutch Plate Warpage Allowance: 0.002 in. (0.05 maximum)

Note:

For optimum performance, if any friction or clutch plate requires replacement, it is advisable to replace the entire set.

Fig. 3-3-27

4. Thoroughly clean the primary driven gear assembly and spacer.
   Apply a light film of oil on the bushing surface and spacer. Fit the spacer into the bushing. It should be a smooth, thumb-press fit. The spacer should rotate smoothly within the bushing. If appropriate measuring devices are available measure the minimum I.D. of the clutch housing bushing and the maximum O.D. of the bushing spacer. (Fig. 3-3-28)

	Nominal
Clutch Housing Bushing ID.	$1.22^{+0.00004}_{-0.00087}$ in. ($31^{+0.001}_{-0.022}$ mm.)
Bushing Spacer O.D.	$1.22^{-0.00098}_{-0.00161}$ in. ($31^{-0.025}_{-0.041}$ mm.)
Bushing/Spacer Clearance	0.00138 ~ 0.00161 in. (0.035 ~ 0.055 mm.)

5. Check the bushing, spacer and main shaft for signs of galling heat damage, etc. If severe, replace as required.

	Nominal
Main Shaft O.D.	$1.00^{-0.01654}_{-0.01658}$ in. ($25^{-0.020}_{-0.041}$ mm.)
Bushing Spacer I.D.	$1.00^{-0.01575}_{-0.01614}$ in. ($25^{+0.000}_{-0.010}$ mm.)
Shaft/Spacer Clearance	0.00079 ~ 0.00200 in. (0.020 ~ 0.051 mm.)

6. Apply a thin coat of oil on transmission main shaft and bushing spacer I.D. Slip spacer over main shaft. Spacer should fit with approximately same "feel" as in clutch housing. Replace as required. See measurement tolerances.
7. Check dogs on driven gear (clutch housing).
   Look for cracks and signs of galling on edges. If moderate, deburr. If severe, replace. (Fig. 3-3-29)
8. Check splines on clutch boss for signs of galling. If moderate, deburr. If severe, replace.

Note:

Galling on either the friction plate dogs of the clutch housing or clutch plate splines of the clutch boss will cause erratic clutch operation.

9. Measure each clutch spring. If beyond tolerance, replace. (Fig. 3-3-30)

DT250B/DT400B	New	Minimum
Clutch Spring Free Length	1.437 in. (36.5 mm.)	1.398 in. (35.5 mm.)

Note:

For optimum clutch operation it is advisable to replace the clutch springs as a set, if one or more are faulty.

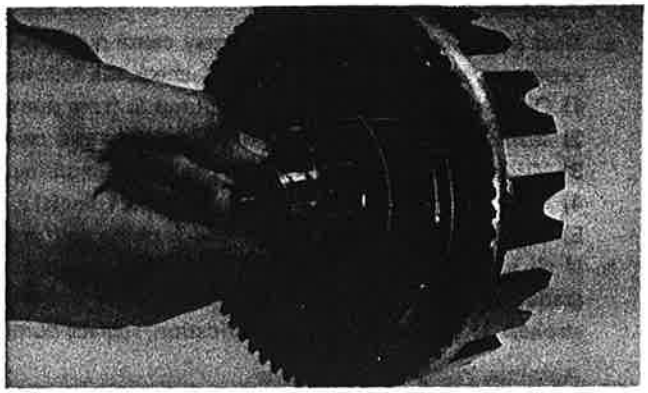


Fig. 3-3-28

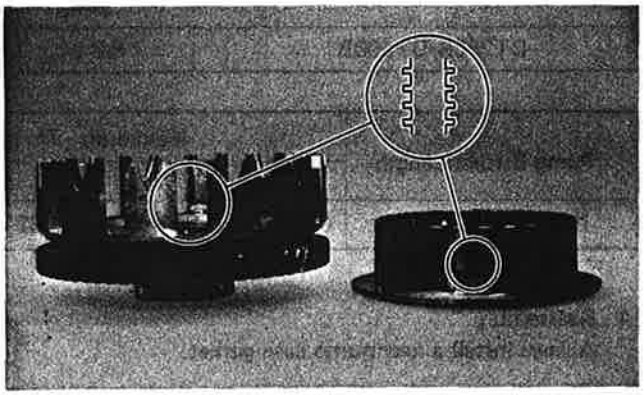


Fig. 3-3-29

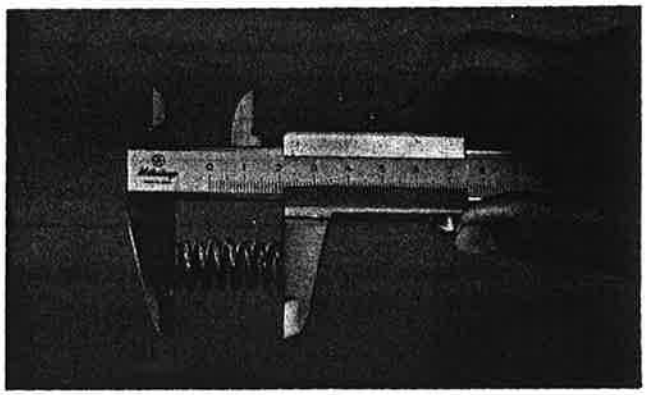


Fig. 3-3-30

10. Roll the push rod across a surface plate. If rod is bent, replace. (Fig. 3-3-31)

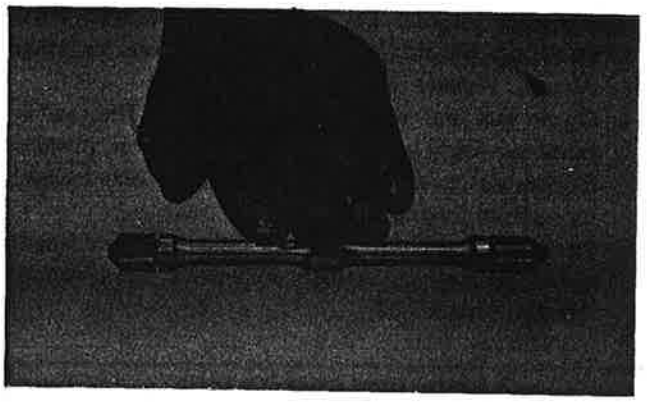


Fig. 3-3-31

I. Primary drive

Primary drive is via helical cut gears. The drive gear is mounted on the crankshaft and the driven gear is integral with the clutch assembly and mounted on the transmission main shaft.

Primary Reduction Ratio			
Model	No. of Teeth		Ratio
	Drive	Driven	
DT250B	23	65	2.826
DT400B	24	64	2.666

1. Check the drive gear and driven gear for obvious signs of wear or damage from foreign material within the primary case.
2. If primary drive gears exhibit excessive noise during operation, gear lash may be incorrect. Numbers are scribed on the side of each gear. Add these numbers. If the total exceeds tolerance, replace with a numbered gear that will bring total within specification.

Note:

This procedure is rarely required. However, if a gear must be replaced due to damage, it is always advisable to pay strict attention to the lash numbers during replacement.

	Lash Numbers	
	DT250B	DT400B
Primary Drive Gear	02 to 06	23 to 27
Primary Driven Gear	42 to 49	45 to 52
Lash Tolerance	41 to 44	64 to 68

3. Check the sholder on the primary drive gear where the crankshaft seal rides. It should not be severely worn or galled. If so, replace gear and seal.
4. Check the O-ring on the crankshaft. If damaged or misshapen, replace.

J. Kick starter

1. Check the ratchet teeth on the kick gear and ratchet wheel. The mating edges should fit flush against each other. If there is severe rounding off, replace as set.
2. Check to see that the kick gear spins freely on the kick axle. If not, replace either or both as required. Replace if any signs of galling are found.

3. Check to see that the ratchet wheel (splined) slides freely on the kick axle. Check for burrs or other damage. Replace as required.
4. Check axle and wheel splines for wear. The ratchet wheel is a fairly loose fit on splines. However, if wheel is so loose it catches on shaft keeping ratchet wheel spring from forcing it out, replace.
5. Check ratchet wheel spring for fatigue. If free length shows spring has collapsed beyond specification, replace. (Fig. 3-3-32)

Ratchet Wheel Spring Free Lengh	
Nominal	Minimum
0.688 in. (17.2 mm.)	0.600 in. (15.0 mm.)

6. In the case of the DT400B, the kick mechanism is linked to a decompression relief valve within the cylinder to reduce compression pressure for easier starting. The actuating cable is connected to a link arm which is moved by the detent arm on the ratchet wheel. (Fig. 3-3-33)

K. Transmission

1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar. (Fig. 3-3-34)
2. Roll the guide bars across a surface plate. If any bar is bent, replace.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.
4. Check the cam followers on each shift fork for wear. The follower should fit snugly into its seat in the shift fork, but not over-tight. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace.
5. Check shift cam dowel pins and side plate for looseness, damage, or wear. Repair as required.
6. Check the shift cam stopper plate and circlip for wear or looseness. Replace as required.
7. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent, replace.
8. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling, or other extreme wear. Replace as required.
9. Check to see that each gear moves freely on its shaft.
10. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
11. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.

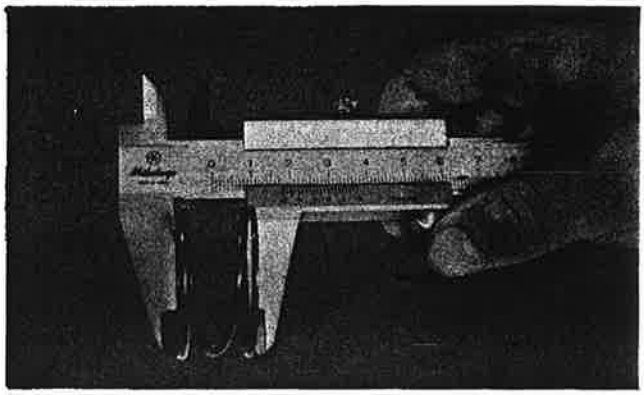


Fig. 3-3-32

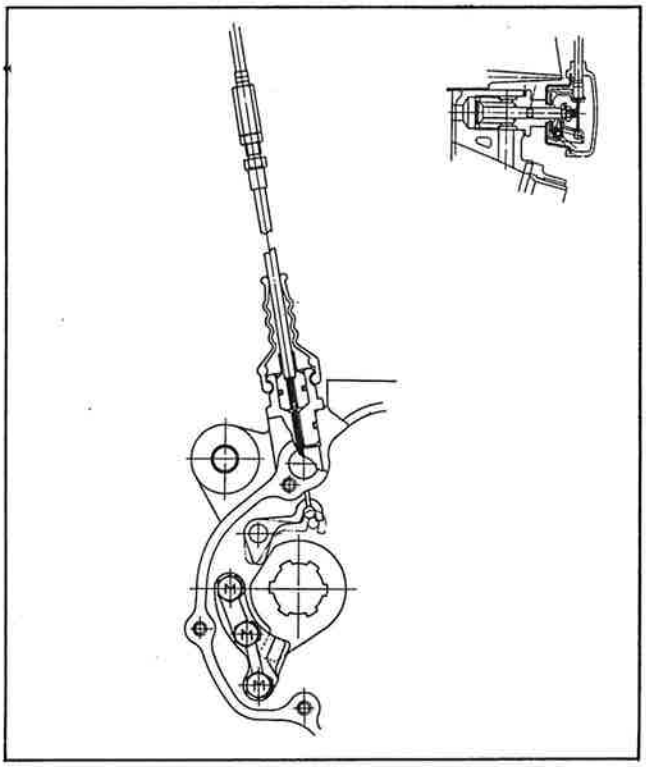
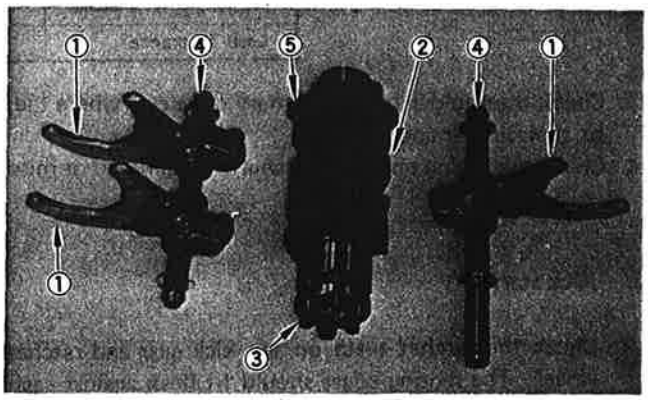


Fig. 3-3-33



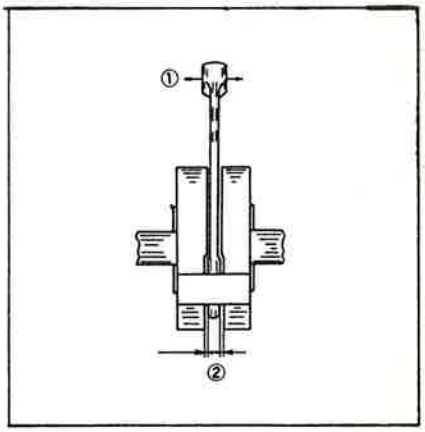
1. Shift fork
2. Shift cam
3. Dowel pin
4. Guide bar
5. Shift cam stopper plate

Fig. 3-3-34

L. Crankshaft

1. The crankshaft requires the highest degree of accuracy in engineering and servicing of all the engine parts.
2. The crankshaft is more susceptible to wear, and therefore, the crank bearings must be inspected with special care.
3. Check crankshaft components per chart.

Check Connecting Rod Axial Play at Small End (to Determine the Amount of Wear of Crank Pin and Bearing at Big End).	Small End Play Should not Exceed 0.08 in. (2 mm.).	If Small End Play Exceeds 0.08 in. (2 mm.), Disassemble the Crankshaft, Check Connecting Rod, Crank Pin and Big End Bearing. Replace Defective Parts. Play after Reassembly should be within 0.032 ~ 0.04 in. (0.8 ~ 1.0 mm.).
Check the Connecting Rod Side Clearance at Bid End.	Move the Connecting Rod to One Side and Insert a Feeler Gauge. Big End Axial Play Should be within 0.016 ~ 0.020 in. (0.4 ~ 0.5 mm.).	If Excessive Axial Play is Present, 0.024 in. (0.6 mm.) or More, Disassemble the Crankshaft and Replace Any Worn Parts.
Check Crankshaft Assembly Runout. (Misalignment of Crankshaft Parts.)	Dial Gauge Readings Should be within 0.0012 in. (0.03 mm.).	Correct Any Misalignment by Tapping the Flywheel with a Brass Hammer and by Using a Wedge.



1. Axial play 2. Side clearance

Fig. 3-3-35

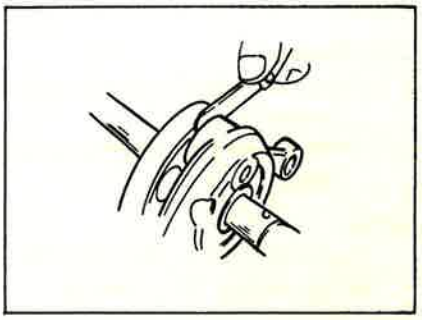


Fig. 3-3-36

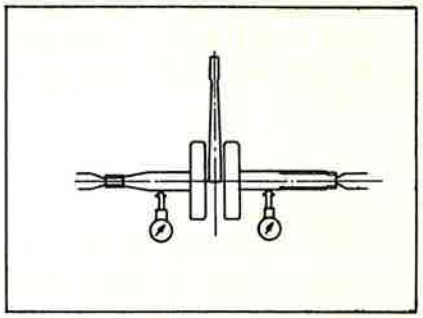


Fig. 3-3-37

Crankshaft Specifications

Unit: in. (mm.)

Model	Deflection Tolerance		Flywheel Width	Rod Clearance			
				Axial		Side	
DT250B	Left side	Right side	F	New	Max.	Min.	Max.
DT400B	0.0012 (0.03)	0.0012 (0.03)	$64^{+0.020}_{-0.050}$	0.032 ~ 0.04 (0.8 ~ 1.0)	0.08 (2.0)	0.016 (0.4)	0.020 (0.5)

M. Bearings and oil seals

1. Inspection

a. After cleaning and lubricating bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing. (Fig. 3-3-38)

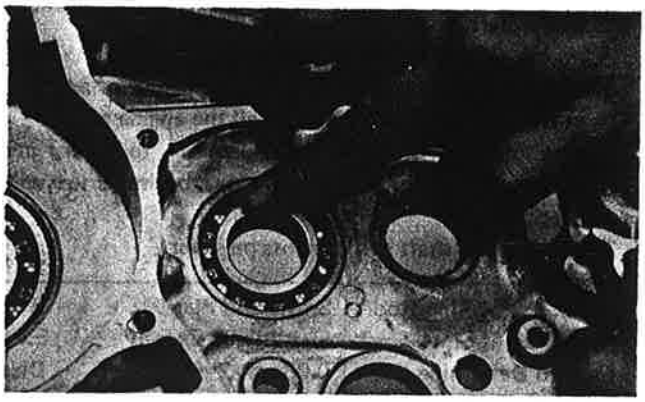


Fig. 3-3-38

b. Check oil seal lips for damage & wear. Replace as required. (Fig. 3-3-39)

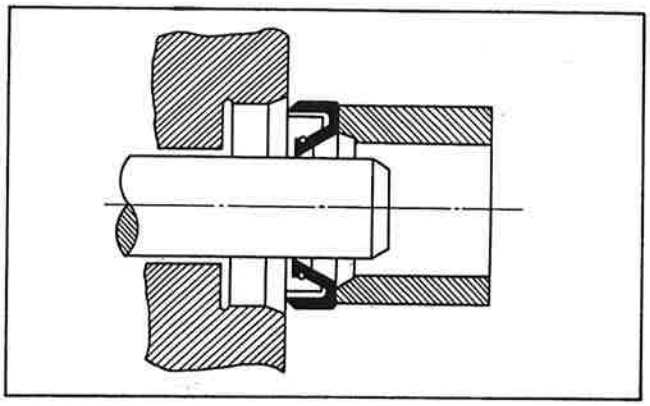


Fig. 3-3-39

2. Removal

a. Pry oil seal(s) out of place using a slot head screwdriver.
Always replace all oil seals when overhauling engine. (Fig. 3-3-40)

Note:

Place a piece of wood under the screwdriver to prevent damage to case. (Fig. 3-3-40)

b. Drive out bearing(s) with socket and hammer.

Note:

Bearing(s) are most easily removed or installed if the cases are first heated to approximately 200° ~ 250°F. Bring the case up to proper temperature slowly. Use an oven.

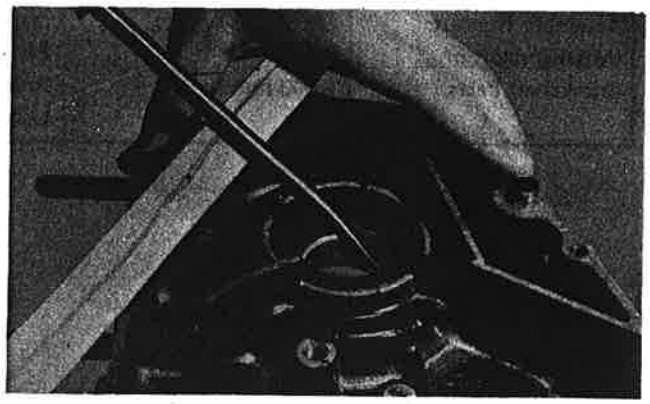


Fig. 3-3-40

3. Installation

Install bearing(s) and oil seal(s) with their manufacture's marks or numbers facing outward. (In other words, the stamped letters must be on the exposed view side). When installing bearing(s) or oil seal(s), apply a light coating of light-weight lithium base grease to balls and seal lip(s). (Fig. 3-3-41)

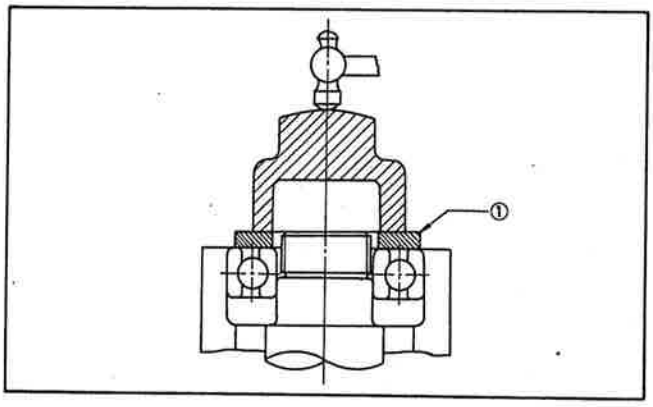


Fig. 3-3-41 1. Spacer

N. Crankcase

1. Thoroughly wash the case halves in mild solvent.
2. Clean all gasket mating surfaces and crankcase mating surfaces thoroughly.
3. Visually inspect case halves for any cracks, road damage, etc..
4. Check all fittings not previously removed for signs of loosening or damage.
5. If bearings have been removed, check their seats for signs of damage (such as the bearing spinning in the seat, etc.).
6. Check oil delivery pasages in transfer ports for signs of blockage.
7. If bearings have not been removed, oil them thoroughly immediately after washing and drying. Rotate the bearings checking for roughness indicating damaged races or balls.
8. Check needle bearing(s) in transmission section for damage. Replace as required.

3-4. Engine assembling and adjustment

A. Crankshaft installation

After all bearings and seals have been installed in both crankcase halves, install crankshaft as follows:

1. Put shim on left side of the crankshaft, set the crankshaft into left case half and install crankshaft installing tool. (Fig. 3-4-1)
2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing. (Fig. 3-4-1)

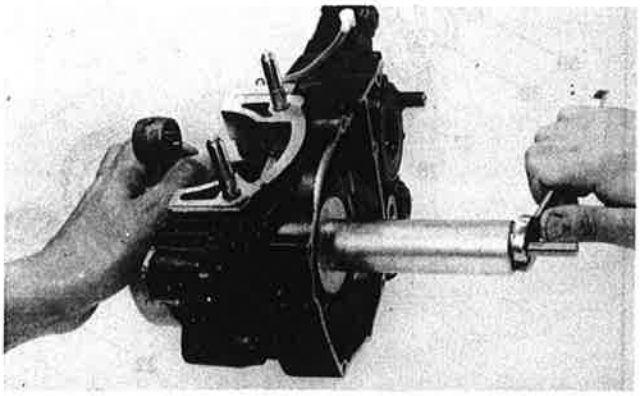


Fig. 3-4-1

B. Transmission installation

1. Paying particular attention to the parts illustration, assemble the transmission shafts, shift cam, and shift forks and guide bars in your hand. INSTALL CLUTCH PUSH ROD IN LEFT END OF MAIN AXLE. (Fig. 3-4-2)
2. Install the assembly into the left case half. Tap into place with soft hammer until all shafts are fully seated. (Fig. 3-4-2)
3. Check to see that all parts move freely prior to installing right case half. Check for correct transmission operation and make certain that all loose shims are in place.

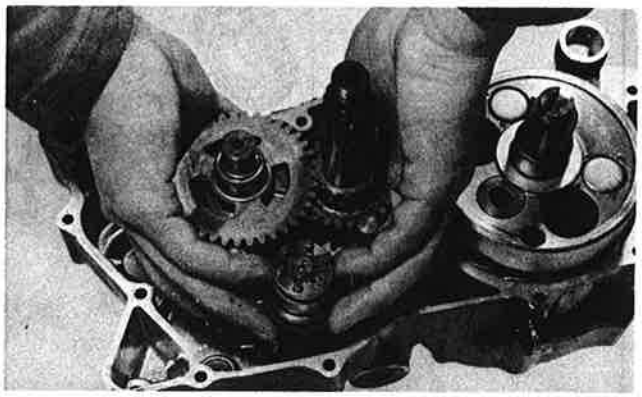
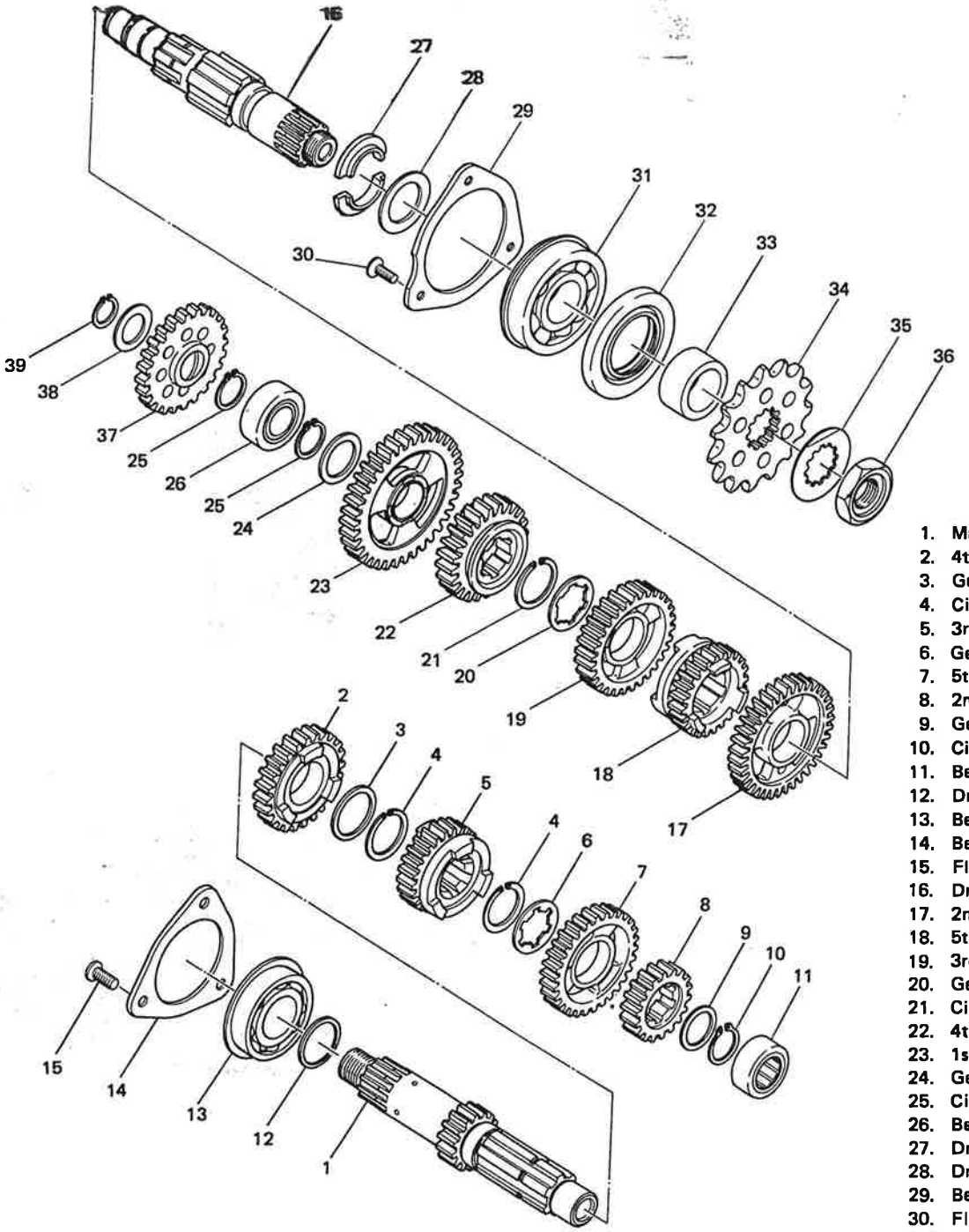
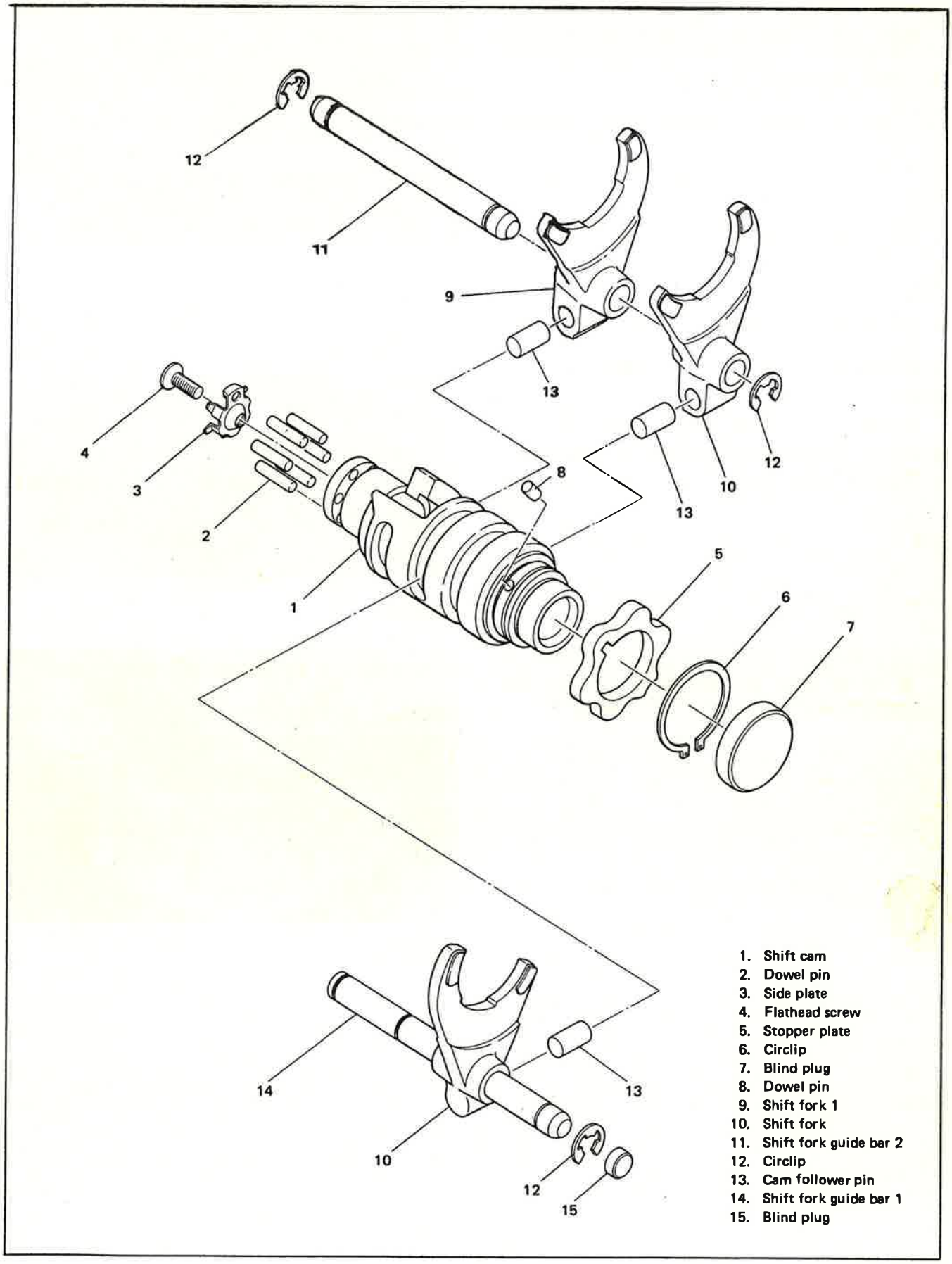


Fig. 3-4-2



1. Main axle
2. 4th pinion gear
3. Gear hold washer
4. Circlip
5. 3rd pinion gear
6. Gear hold washer
7. 5th pinion gear
8. 2nd pinion gear
9. Gear hold washer
10. Circlip
11. Bearing
12. Drive axle shim
13. Bearing
14. Bearing cover plate
15. Flathead screw
16. Drive axle
17. 2nd wheel gear
18. 5th wheel gear
19. 3rd wheel gear
20. Gear hold washer
21. Circlip
22. 4th wheel gear
23. 1st wheel gear
24. Gear hold washer
25. Circlip
26. Bearing
27. Drive axle spacer
28. Drive axle
29. Bearing cover plate
30. Flathead screw
31. Bearing
32. Oil seal
33. Distance collar
34. Drive sprocket
35. Lock washer
36. Locknut
37. Kick idle gear
38. Plate washer
39. Circlip

Fig. 3-4-3



1. Shift cam
2. Dowel pin
3. Side plate
4. Flathead screw
5. Stopper plate
6. Circlip
7. Blind plug
8. Dowel pin
9. Shift fork 1
10. Shift fork
11. Shift fork guide bar 2
12. Circlip
13. Cam follower pin
14. Shift fork guide bar 1
15. Blind plug

Fig. 3-4-4

C. Crankcase

1. Apply Yamaha Bond No. 4 to the mating surfaces of both case halves. Apply thoroughly, over all mating surfaces. (Fig. 3-4-5)

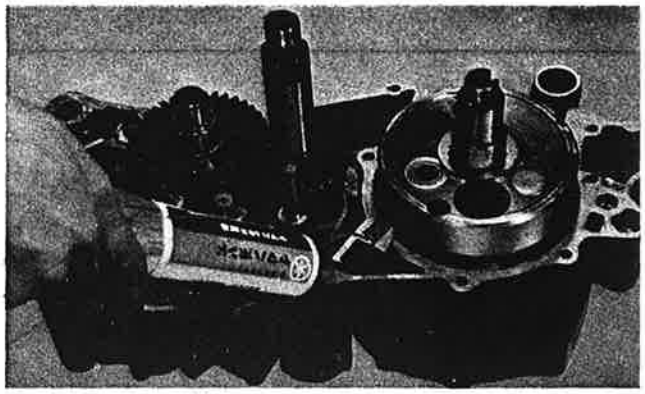


Fig. 3-4-5

2. Set the crankcase right half onto the shafts and tap lightly on the case with a soft hammer to assemble. (Fig. 3-4-6)

Note:

Do not tap on machined surface or end of crankshaft.

3. Install all crankcase bolt and tighten in stages using crisscross pattern.

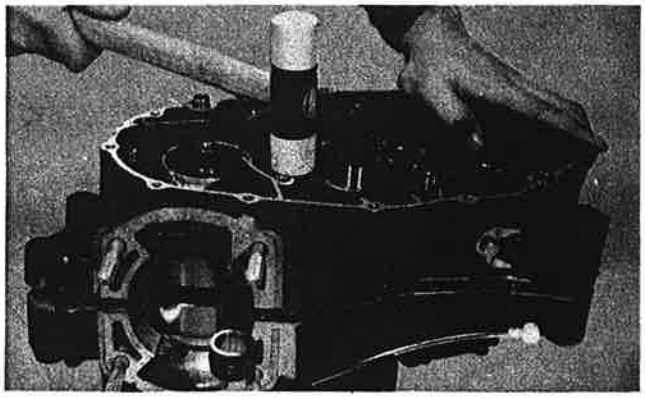


Fig. 3-4-6

4. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole. (Fig. 3-4-7)

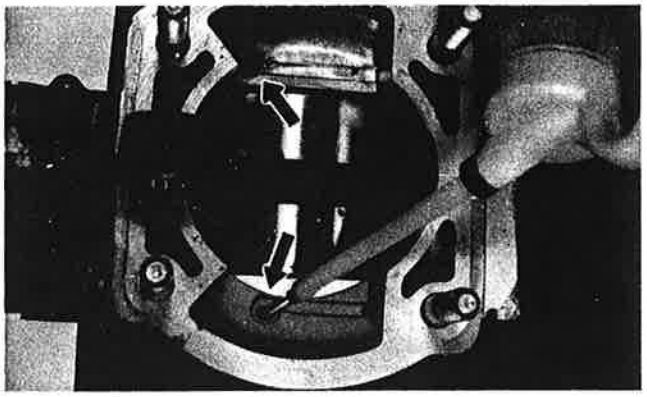
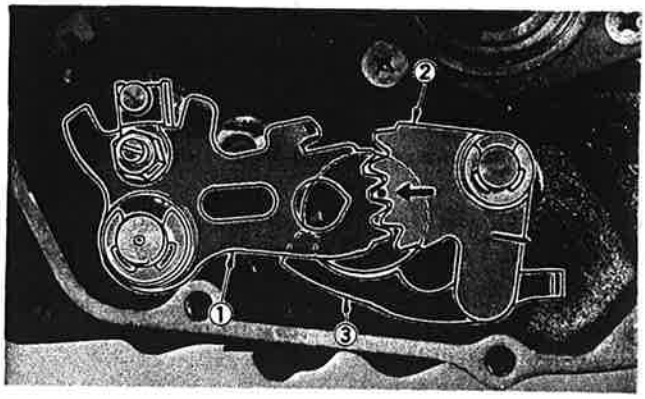


Fig. 3-4-7

5. Install clutch push lever axle and shift cam stopper. (Fig. 3-2-16), (Fig. 3-2-17)
6. Check crankshaft and transmission shafts for proper operation and freedom of movement.

D. Shifter

1. During installation, note the index mark on change lever 2 and center of change lever 1. Align. (Fig. 3-4-8)



1. Change lever 1
2. Change lever 2
3. Change lever 3

Fig. 3-4-8

2. In 2nd gear, check for proper centering. Change adjustment on screw as required. (Fig. 3-4-9)
3. With the change pedal in place on the change shaft, push down then up. There should be no freeplay. If evident, the shift return spring is fatigued, replace.
4. Check the return spring for change levers 2 and 3. If it will not hold change lever 3 firmly against the shift cam dowel pins, replace.

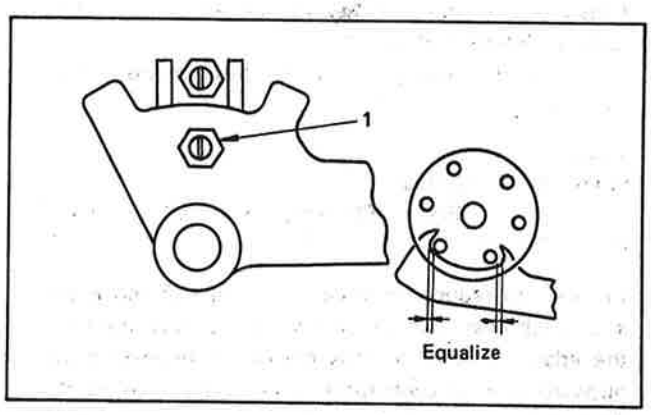


Fig. 3-4-9 1. Adjusting screw

E. Kick starter assembly

1. Install kick crank on the kick axle temporalily.
2. While keeping the kick stopper (ratchet wheel) upwards, engage the kick axle return spring with the slot on end of the kick axle. (Fig. 3-4-10)

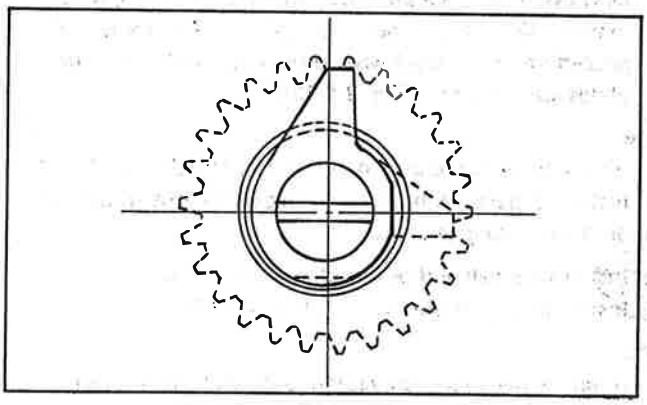


Fig. 3-4-10

3. Rotate kick crank counterclockwise approximately 3/4 turn and push straight in. (Fig. 3-4-11)

F. Kick idle, tachometer drive and primary drive gears

Install kick idle gear, tachometer drive gear and primary drive gear. (Fig. 3-4-12)

Note:

Tighten primary drive gear securing nut after clutch assembly is installed.

G. Clutch

1. Install thrust plate primary driven gear, thrust plate and clutch boss in that order.
2. Install clutch holding tool on clutch boss and tighten lock nut.

Clutch lock nut torque:
600 ~ 700 in-lbs. (7.0 ~ 8.0 m-kgs.)

3. In order to reduce noise caused by the clutch plates and clutch boss, each clutch plate is cut away at part of the edge #1. This permits the clutch plate to move outward due to centrifugal force. Align one of the plate cutaways so that it is centered as shown in #2 with the arrow on the hub. Install a friction plate. next install a clutch plate with cutaway off-set approximately 60° from previous plate. Continue this procedure in a clockwise direction until all clutch plates are installed. (Fig. 3-4-13)

Note:

Install thickness clutch plate on the clutch boss first. Install all parts with a heavy coat of 10-30W motor oil on their mating surfaces.

4. Install steel ball and push rod into main axle.
5. Install clutch pressure plate. (Fig. 3-4-14)

Note:

Align arrow mark on clutch boss and pressure plate mark.

Caution:

Tighten primary drive gear nut at this time.

Primary drive gear nut torque:
600 ~ 800 in-lbs. (7.0 ~ 9.0 m-kgs.)

H. Crankcase cover, right

While properly engaging crankshaft and oil pump worm shaft, install crankcase cover (right). (Fig. 3-2-8)

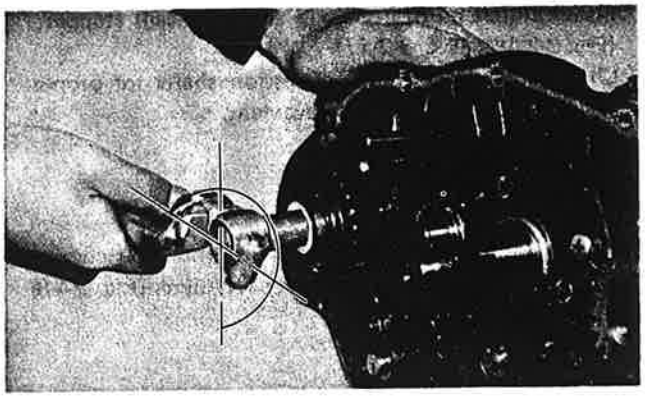


Fig. 3-4-11

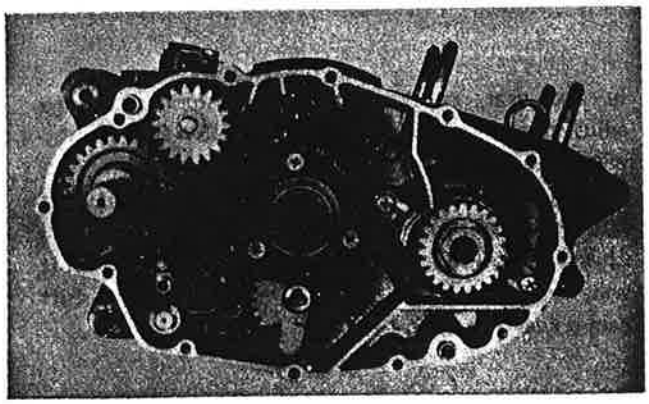


Fig. 3-4-12

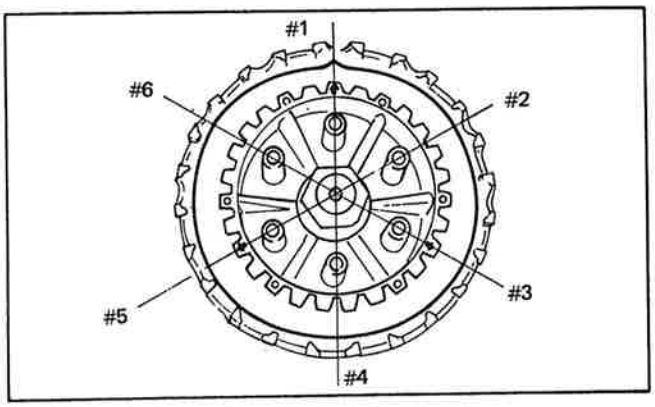


Fig. 3-4-13

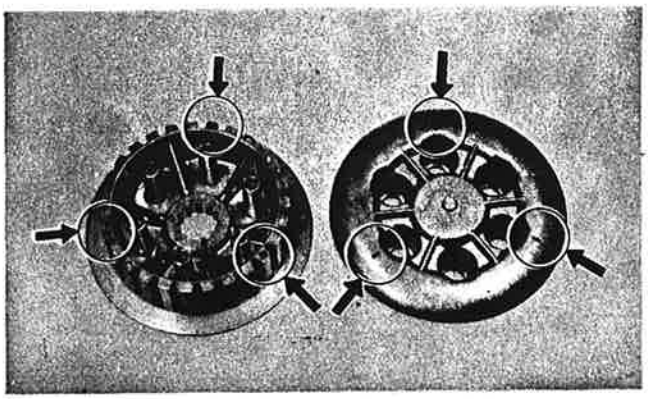
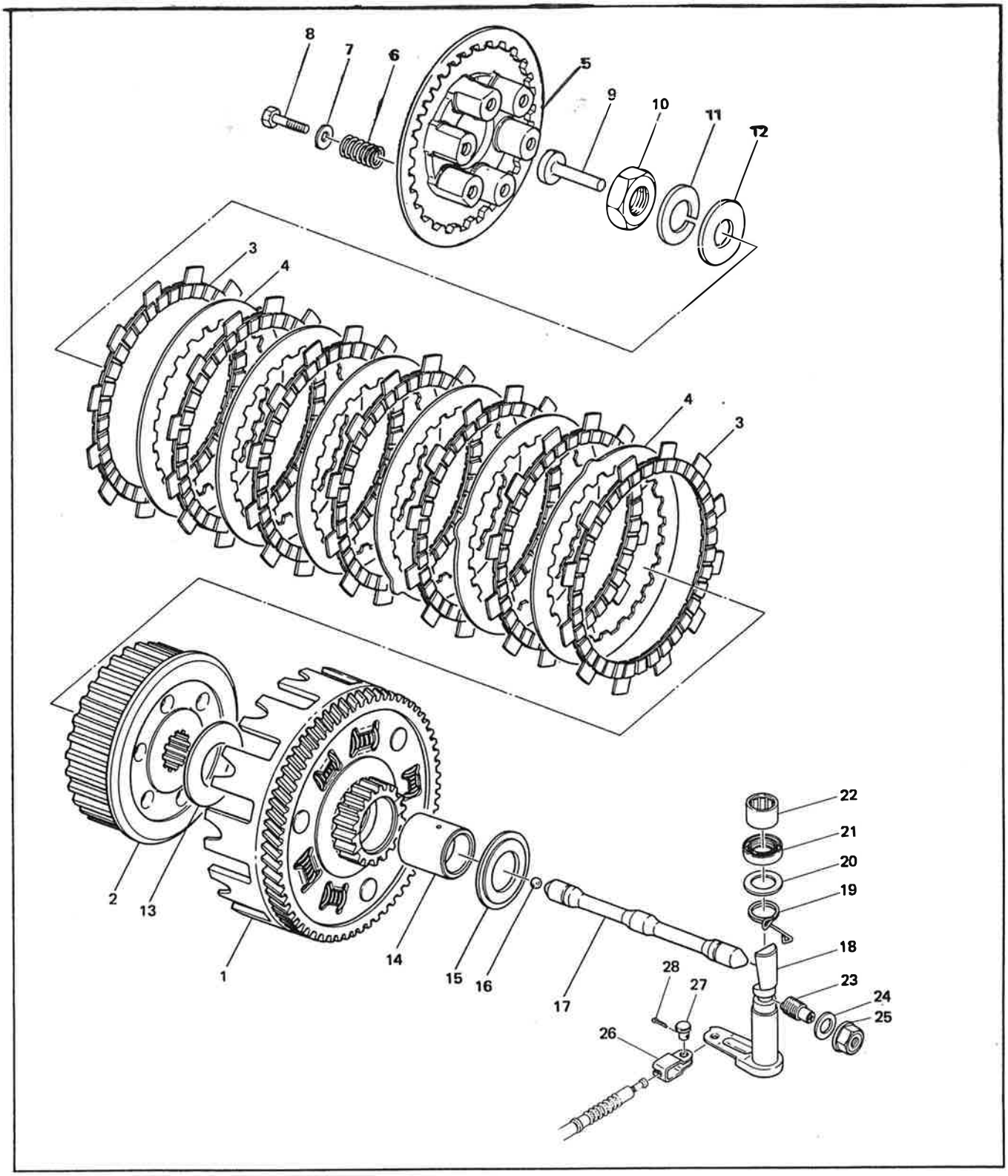


Fig. 3-4-14



1. Primary driven gear complete
2. Clutch boss
3. Friction plate
4. Clutch plate
5. Pressure plate
6. Clutch spring
7. Plate washer
8. Crossrecess hexagon screw
9. Push rod
10. Lock nut
11. Spring washer
12. Plain washer
13. Thrust plate 2
14. Spacer
15. Thrust plate 1
16. Ball
17. Push rod
18. Push lever axle
19. Return spring
20. Plate washer
21. Oil seal
22. Bearing
23. Adjusting screw
24. Gasket
25. Adjusting nut
26. Joint
27. Pin
28. Cotter pin

Fig. 3-4-15

I. Piston

1. During reassembly, coat the piston ring grooves, piston skirt areas, piston pin and bearing with two-stroke oil.
2. Install new piston pin clips and make sure they are fully seated in their grooves.

Note:

Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed. Note the two induction holes in the piston skirt. These must be to the rear during installation. (Fig. 3-4-16)

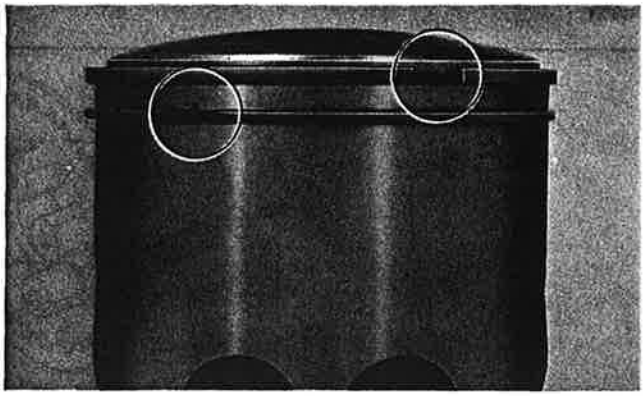


Fig. 3-4-16

J. Cylinder

1. Install a new cylinder base gasket.
2. Install cylinder with one hand while compressing piston rings with other hand. (Fig. 3-4-17)

Note:

Make sure the rings are properly positioned.

Cylinder Bolt Torque:
4.2— 4.5

Fig. 3-4-17

K. Cylinder head

Install cylinder head gakset and cylinder head.

Note:

The projection of the cylinder head gasket must be forward. (Fig. 3-4-18)

Cylinder Head Nut Torque:
2.1— 2.5

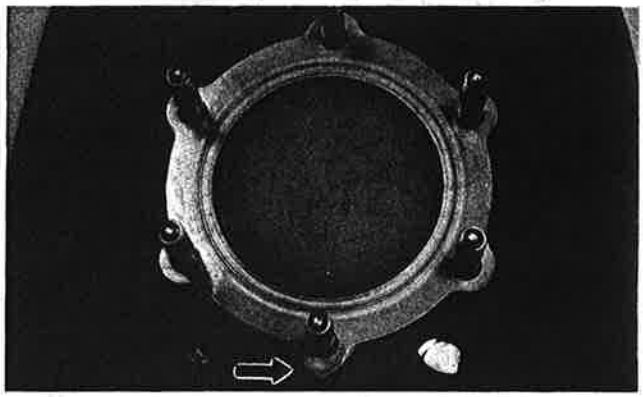


Fig. 3-4-18

3-5. Mounting

Refer to sections 2-3, 2-5 and 3-1 and mount the engine in the frame as follows:

1. Place the engine in the frame from right side. (Refer to 3-1, I)
2. Install six engine mounting bolts with proper tightening torque. (Refer to 3-1, I)

Tightening Torque	
Bolt Size	Torque
10 mm.	400 ~ 480 in-lbs. (4.5 ~ 5.5 m-kgs.)
8 mm.	220 ~ 250 in-lbs. (2.5 ~ 2.9 m-kgs.)

3. Install drive sprocket and chain.

Note:

Install chain joint in proper direction. (See Fig. 3-5-1)

4. Tighten drive sprocket with proper torque. (Refer to 3-1, H)

Drive sprocket nut torque: 600 ~ 800 in-lbs. (7.0 ~ 9.0 m-kgs.)

5. Install clutch wire, and adjust. (Refer to 3-1, D)
6. Install flywheel magneto and connect wires. (Refer to 2-3, E)

Note:

When installing flywheel, make sure woodruff key is properly seated in keyway of crankshaft. Apply a light coating of lithium soap base grease to tapered portion of crankshaft end. Carefully install flywheel taking care to align for woodruff key. Install bevelled washer, lockwasher and lock nut. Tighten carefully to recommended torque value.

Flywheel nut torque: 600 ~ 650 in-lbs. (7.0 ~ 7.5 m-kgs.)

Whenever the flywheel is removed, ignition timing must be re-set. (Refer to 2-5, B or C)

7. Adjust ignition timing. (Refer to 2-5, B or C)
8. Install crankcase cover (left) and change pedal. (Refer to 3-1, F)
   Position of change pedal is shown in Figure 3-5-2.
9. Install tachometer cable. (Refer to 3-1, D)
10. Install carburetor assembly and adjust. (Refer to 3-1, E)
11. Install muffler. (Refer to 3-1, C)
12. Install oil pump wire and adjust. (Refer to 3-1, D), (Refer to 2-3, C)
13. Install fuel tank. (Refer to 3-1, B)

CHAPTER 4. CARBURETION

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4

4

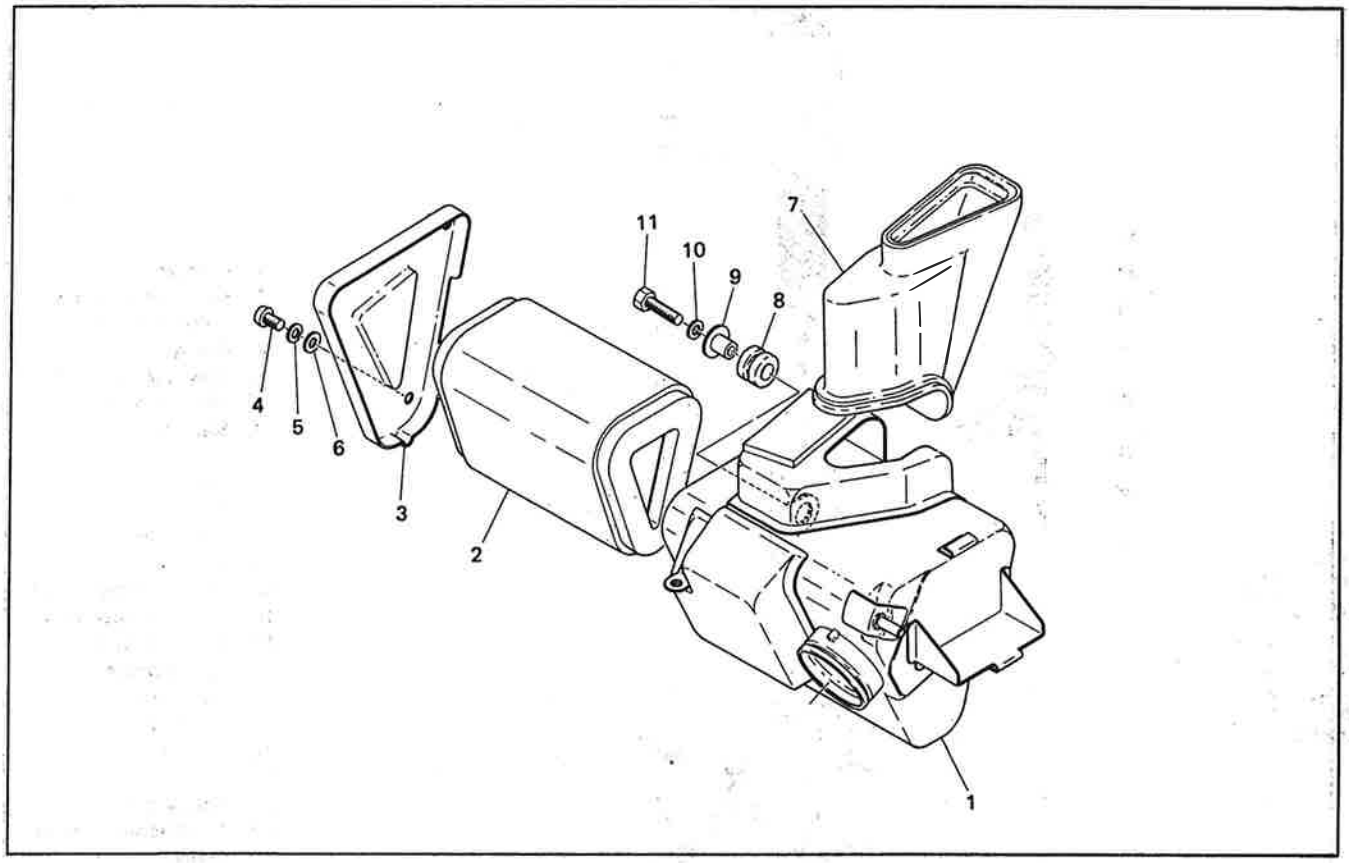
CHAPTER 4. CARBURETION

4-1. Air cleaner

A. Description

1. The air filter is housed within a case below the oil tank.
2. The filter is made of Polyurethene foam with a stiff bristle covering.
3. For carburetion to function properly, the filter must be in place; must be clean; and must be damp with oil to provide adequate protection to vital engine parts.
4. For air filter maintenance see Chapter 2, Section 3-B.

Air cleaner



1. Air cleaner case
2. Air cleaner element
3. Case cap
4. Pan head screw
5. Spring washer
6. Washer
7. Duct
8. Battery box damper 1
9. Fender collar
10. Spring washer
11. Bolt

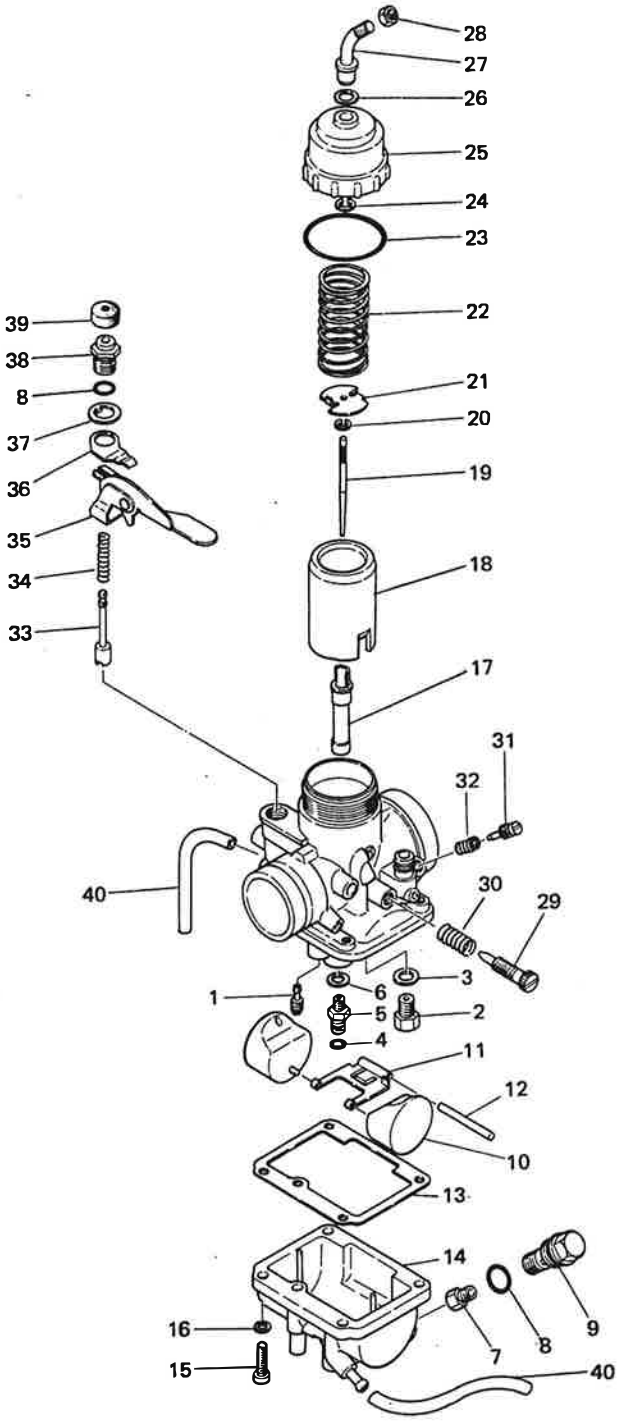
Fig. 4-1-1

4-2. Carburetor

A. Description

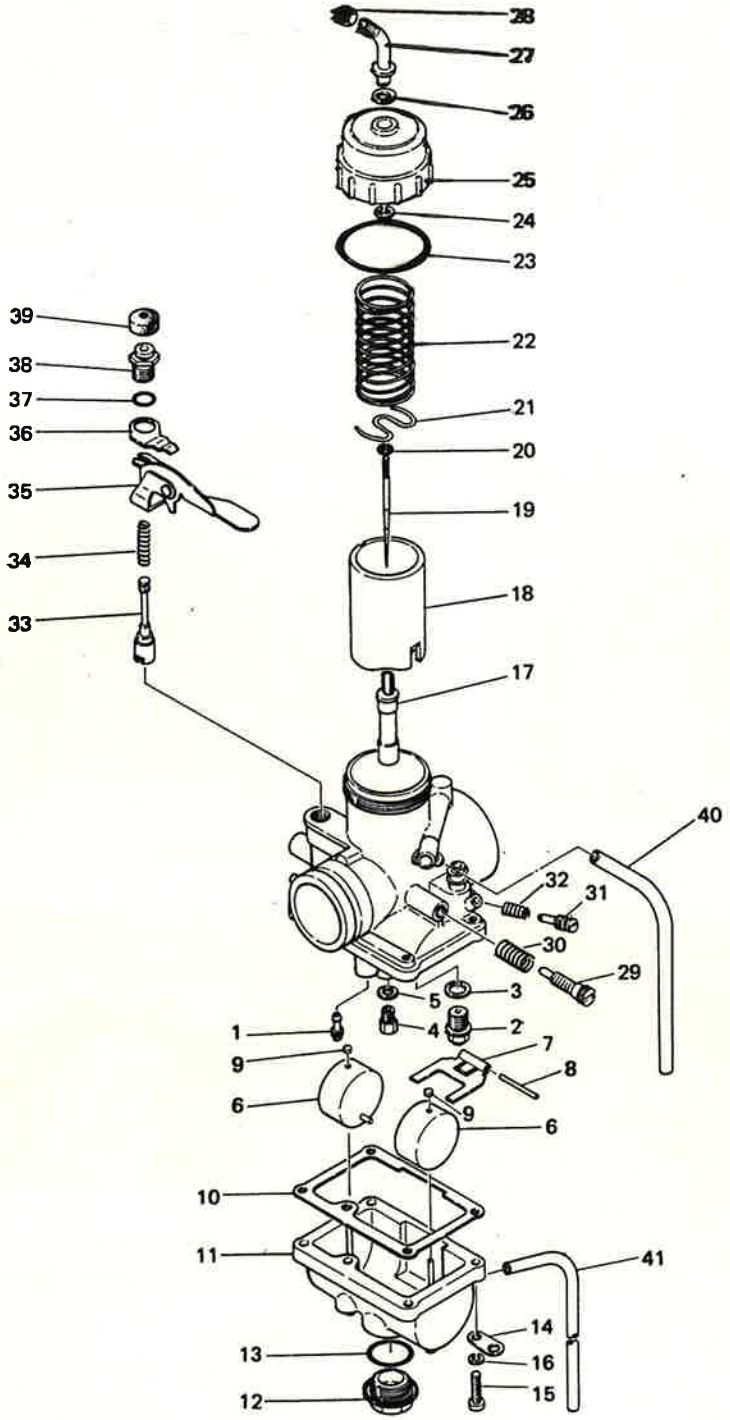
1. The carburetor is of primary concern to proper engine operation. Considerable care should be taken during disassembly, inspection, and maintenance to see that all circuits are working correctly and that all adjustments properly made.
2. Prior to carburetor disassembly, study the sections on air filter, spark plug, Autolube and ignition timing thoroughly. Each of these components works in conjunction with the carburetor to provide maximum performance and longevity.

Carburetor DT250B



1. Pilot jet
2. Seat valve assembly
3. Valve seat washer
4. O-ring
5. Needle jet setter
6. Main jet washer
7. Main jet
8. O-ring
9. Banjo bolt
10. Float
11. Float arm
12. Float pin
13. Float chamber gasket
14. Float chamber body
15. Pan head screw
16. Spring washer
17. Main nozzle
18. Throttle valve
19. Needle
20. Clip
21. Spring seat
22. Throttle valve spring
23. O-ring
24. Clip
25. Mixing chamber top
26. Packing
27. Guide wire tube
28. Wire adjusting nut
29. Idle speed screw
30. Idle speed spring
31. Pilot air screw
32. Pilot air spring
33. Starter plunger
34. Plunger spring
35. Starter left lever
36. Starter lever plate
37. Starter lever washer
38. Plunger cap
39. Plunger cap cover
40. Pipe

Fig. 4-2-1



1. Pilot jet
2. Seat valve assembly
3. Valve seat washer
4. Main jet
5. Main jet washer
6. Float
7. Float arm
8. Float pin
9. Cap
10. Float chamber gasket
11. Float chamber body
12. Screw plug
13. O-ring
14. Plate
15. Pan head screw
16. Spring washer
17. Main nozzle
18. Throttle valve
19. Needle
20. Clip
21. Spring seat
22. Throttle valve spring
23. O-ring
24. Clip
25. Mixing chamber top
26. Packing
27. Guide cable tube
28. Wire adjusting nut
29. Idle speed screw
30. Idle speed spring
31. Pilot air screw
32. Pilot air spring
33. Starter plunger
34. Plunger spring
35. Starter left lever
36. Starter lever plate
37. O-ring
38. Plunger cap
39. Plunger cap cover
40. Air vent pipe
41. Over flow pipe

Fig. 4-2-2

B. Disassembly

Remove the following parts as shown.

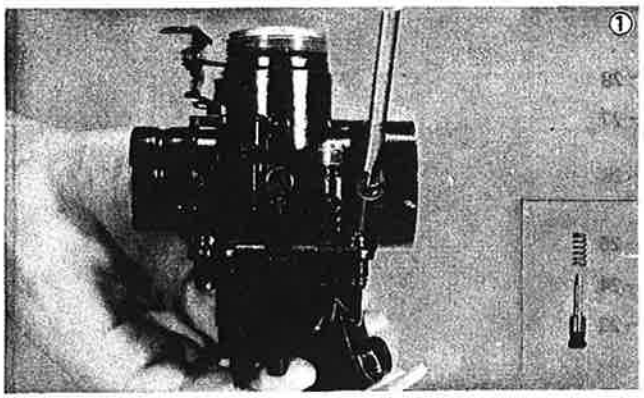


Fig. 4-2-3 Pilot air screw

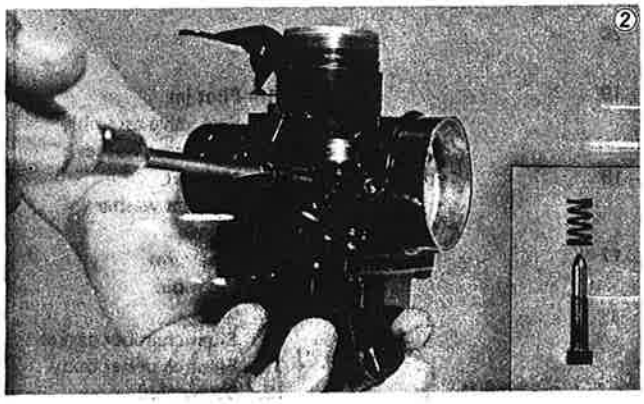


Fig. 4-2-4 Idle speed screw

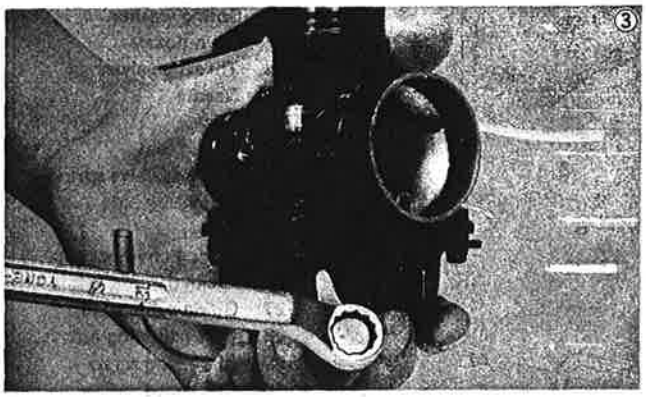


Fig. 4-2-5 Banjo bolt, holding main jet

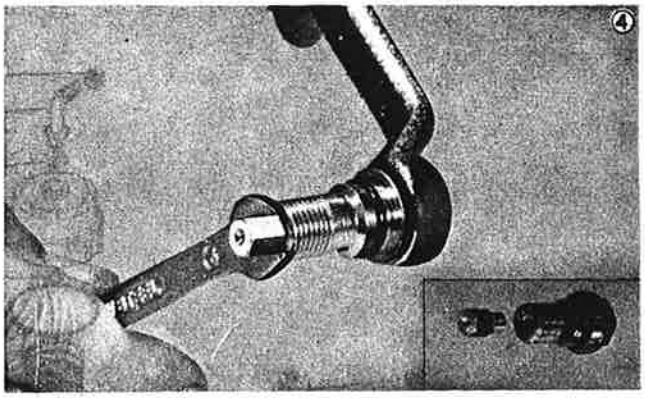


Fig. 4-2-6 Main jet

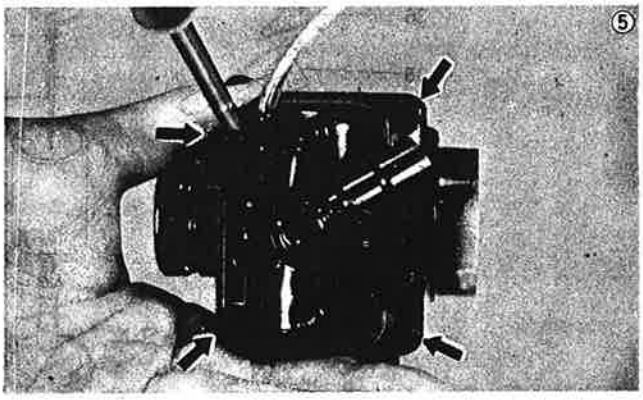


Fig. 4-2-7 Float chamber

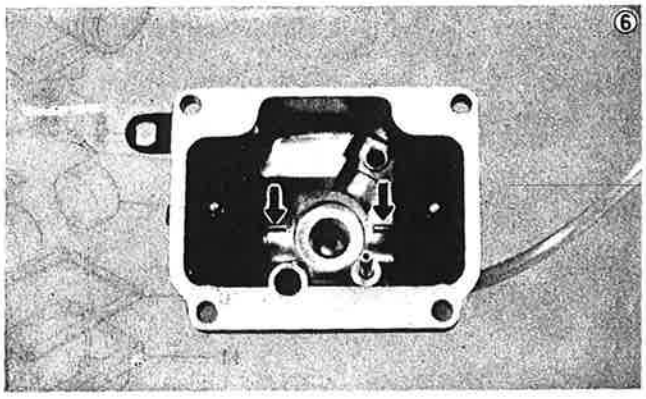


Fig. 4-2-8 Floats

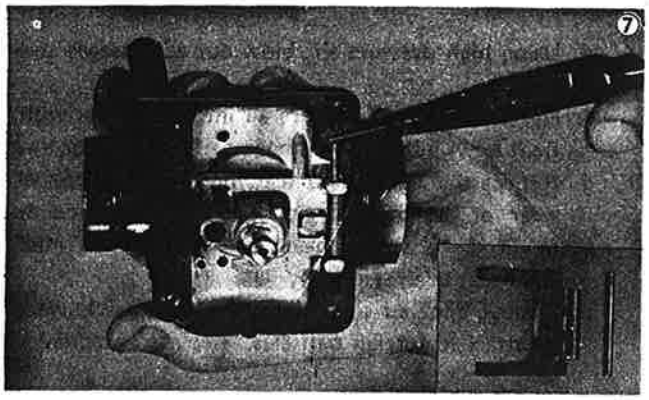


Fig. 4-2-9 Float arm

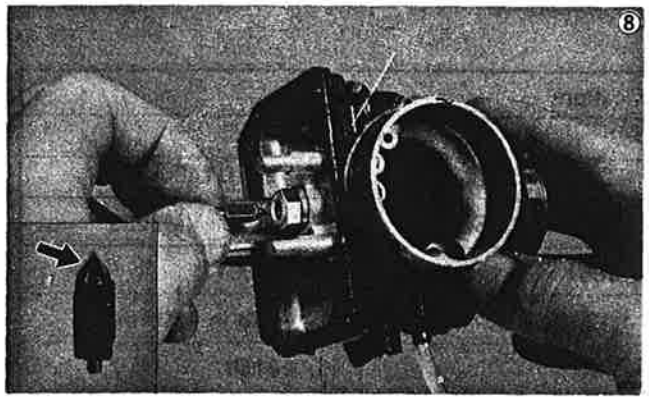


Fig. 4-2-10 Needle valve

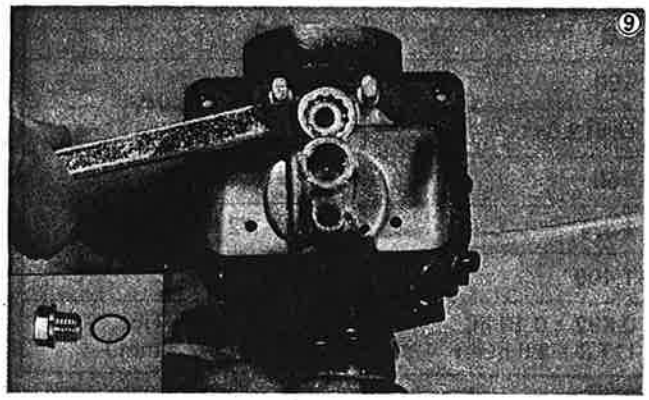


Fig. 4-2-11 Valve seat

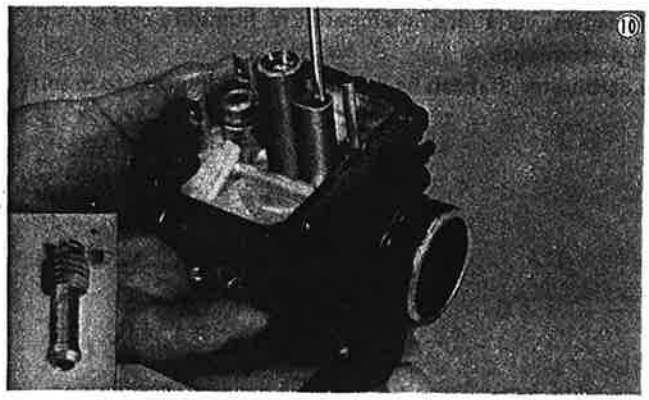


Fig. 4-2-12 Pilot jet

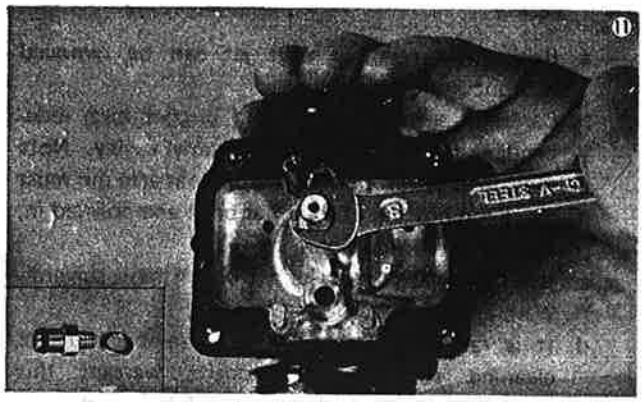


Fig. 4-2-13 Needle jet setter

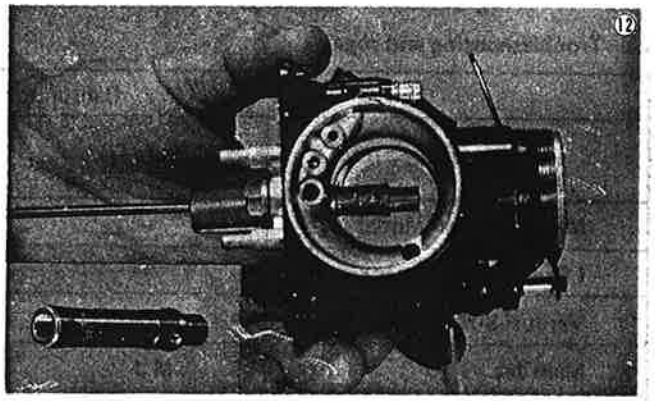


Fig. 4-2-14 Main nozzle

Fig. 4-2-15 Starter jet

Note:

a. Banjo bolt holding main jet can be removed without any disassembly.
b. Carefully set body aside and inspect each independent float within the float bowl cavity. Note their installation position. The float arm pin must be at the bottom of the float bowl and pointed in, toward the center.
c. Wash the carburetor in petroleum base solvent. Wash all associated parts.
d. It is rarely necessary to use special carburetor cleaning solutions. if deposits warrant this procedure, remove the Starter Jet Assembly to avoid damaging the neoprene valve seat.
e. Using high pressure air, blow out all passages and jet's.
f. Never direct high pressure air into carburetor with float bowl installed. Damage to floats may occur.
g. Inspect the needle and seat for signs of excessive wear or attached foreign particles. Replace as required. Always replace inlet needle and inlet valve seat as an assembly.
h. Inspect pilot air screw for signs of excessive wear or attached foreign particles. Replace as required.

C. Troubleshooting and repair

Cabruretor Specifications			
Part Name	Abbrev.	Model	
		DT250B	DT400B
Manufacturer - Model	—	Mikuni VM28SS	Mikuni VM32SS
I.D. Number	—	49861	50061
Venturi Size	—	1.12ϕ in. (28ϕ mm.)	1.2ϕ in. (30ϕ mm.)
Main Jet	M.J	#150	#160
Needle Jet	N.J	0 – 4	0 – 8
Jet Needle/Clip Position	J.N.	5F21-4	6DH2-3
Cut Away	C.A.	3.0	3.0
Pilot Jet	P.J.	#50	#40
Air Jet	A.J	Drill 2.5ϕ	Drill 2.5ϕ
Starter Jet	S.J.	#60	#60
Air Screw (Turns Out)	A.S.	1-3/4	1-1/2
Idle Speed (r.p.m.)	—	1,400	1,500
Float Level	F.L.	0.692 ± 0.10 in. (17.3 ± 2.5 mm.)	0.692 ±0.10 in. (17.3 ± 2.5 mm.)

Note:

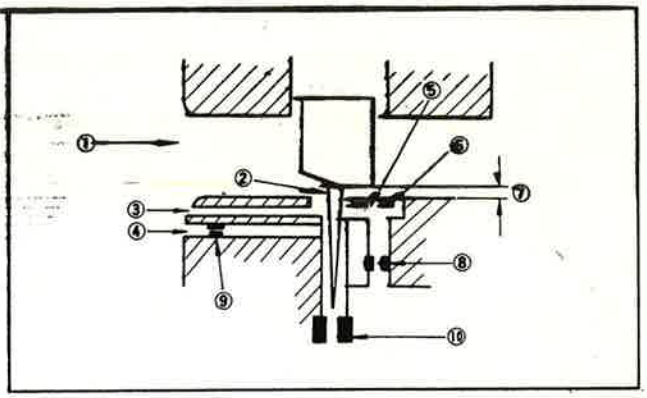
Cylinder porting, combustion chamber compression, ignition timing, muffler design, and carburetor size and component selection are all balanced to achieve optimum performance. However, variations in temperature, humidity and altitude, to name a few, will affect carburetion and consequently, engine performance.

The following list gives each of the major components of the carburetor that can be readily changed in order to modify carburetor performance if required.

1. Pilot air screw

Controls the ratio of air to fuel in the idle circuit. Turning the screw in decreases the air supply giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THIS ADJUSTMENT: ZERO TO 1/8 THROTTLE



1. Main air
2. Jet needle
3. Pilot air
4. Bleed air
5. Bypass
6. Pilot outlet
7. Opening 0 to 1/8 throttle
8. Pilot jet
9. Air jet
10. Main jet

Fig. 4-2-16

2. Pilot jet

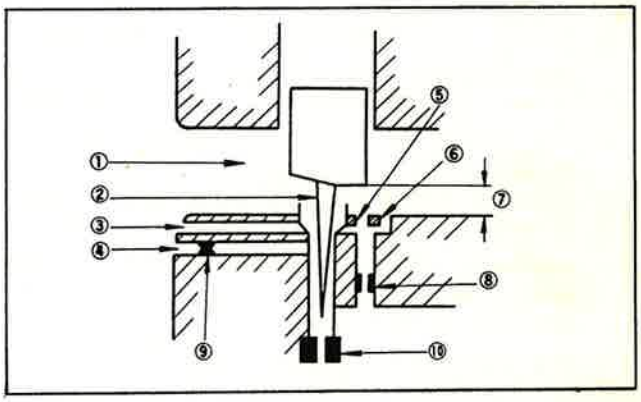
Controls the ratio of fuel to air in the idle circuit. Changing the jet to one with a higher number supplies more fuel to the circuit giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THIS JET: ZERO TO 1/8 THROTTLE.

3. Throttle Valve (Slide):

The throttle valve (slide) has a portion of the base cut away to control air flowing over the main nozzle. A wider angle (more "cutaway") will create a leaner mixture. Throttle valves are numbered according to the angle of the cutaway. The higher the number, the more cutaway, the leaner the mixture.

OPERATING RANGE MOST AFFECTED BY THE THROTTLE VALVE: 1/8 TO 1/4 (~) THROTTLE.



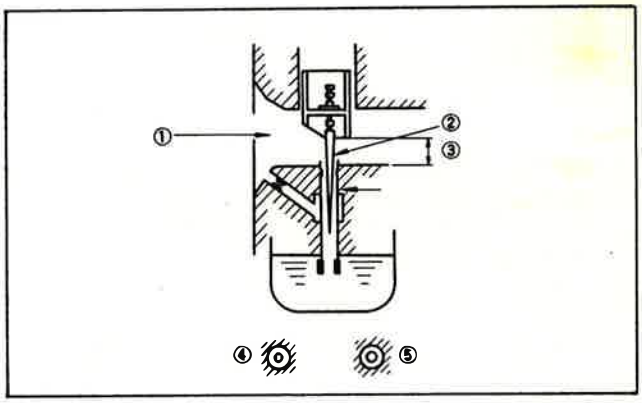
1. Main air
2. Jet needle
3. Pilot air
4. Bleed air
5. Bypass
6. Pilot outlet
7. Opening 1/8 to 1/4
8. Pilot jet
9. Air jet
10. Main jet

Fig. 4-2-17

4. Jet needle

The jet needle is fitted within the throttle valve. The tapered end of the needle fits into the main nozzle outlet. Raising the needle allows more fuel to flow out of the nozzle outlet giving a richer mixture. There are five circlip grooves at the top of the needle. Moving the needle clip from the first, or top groove, through the fifth, or bottom groove, will give a correspondingly richer mixutre.

OPERATING RANGE MOST AFFECTED BY THE JET NEEDLE: 1/4 TO 3/4 THROTTLE.



1. Main air
2. Jet needle
3. Opening 1/4 to 3/4
4. 3/4 throttle
5. 1/4 throttle

Fig. 4-2-18

5. Main jet

The main jet controls overall fuel flow through the main nozzle.

Changing the jet to one with a higher number supplies more fuel to the main nozzle giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THE MAIN JET: 3/4 TO FULL THROTTLE.

Note:

Excessive changes in main jet size can affect overall performance.

Caution:

The fuel/air mixture ratio is a governing factor upon engine operating temperature.

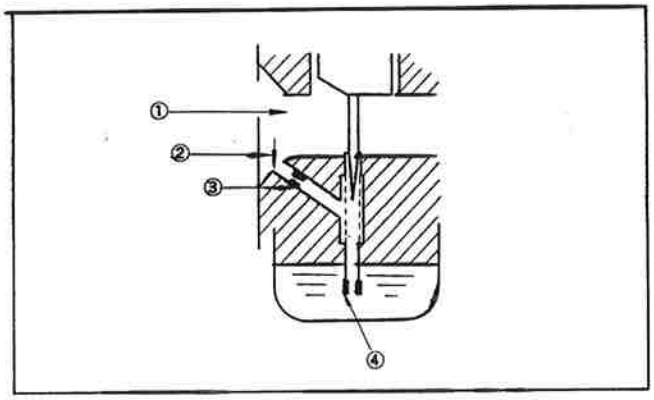
Any carburetor changes, whatsoever, must be followed by a thorough test of spark plug temperature during actual engine operation.

6. Float level

a. Float level is one factor within the carburetor which will change with use. (Fig. 4-2-20)

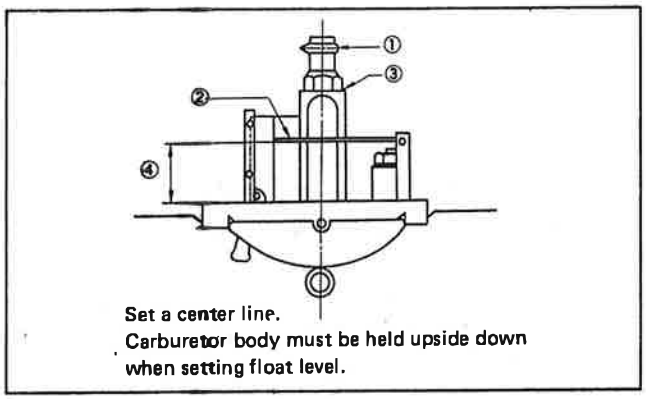
b. If float level within the carburetor float chamber body decreases, the fuel/air mixture ratio will be leaner. If the level increases, mixture will be richer.

c. The level is set according to the design of the carburetor and float bowl chamber. Under no circumstances should float level be altered in an attempt to correct a performance problem. Look for the problem in other, related components or carburetor circuits.



1. Main air
2. Bleed air
3. Air jet
4. Main jet

Fig. 4-2-19



1. Rubber "O" ring CRITICAL/Must be in good condition.
2. Float arm lever
3. Carburetor body surface
4. Float level

Fig. 4-2-20

d. Using a vernier caliper, measure the distance of the float arm from the top of the float chamber gasket seat (gasket removed) to the float arm. (Fig. 4-2-21)

Float level: 0.692 ± 0.10 in. (17.3 ± 2.5 mm.)

Note:

The float arm should be just resting on, but not depressing, the spring loaded inlet needle.

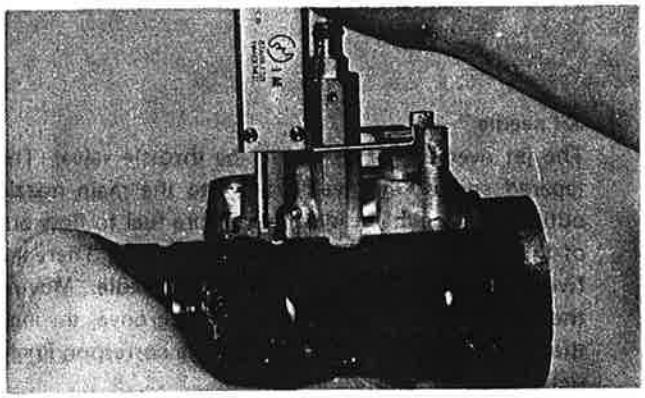


Fig. 4-2-21

e. To correct float arm height, bend the tang a slight amount as required. (Fig. 4-2-22)
Both the right and left sides of the float arm should measure indentically.
Correct as required.

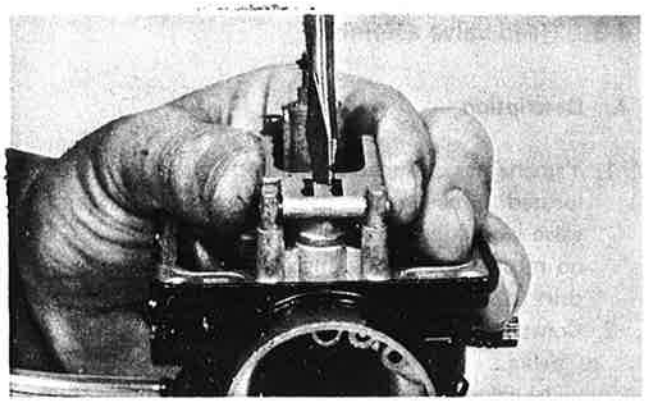


Fig. 4-2-22

D. Reassembly and installation

1. Install the float bowl and main jet banjo bolt.
2. Moving to machine, push needle out of seat in throttle valve (slide). Inspect for signs of bending scratches or wear.
   Repalce as required.
3. Check needle clip position.
   Clip position is counted starting with the first clip groove at the top of the needle. (Fig. 4-2-23)

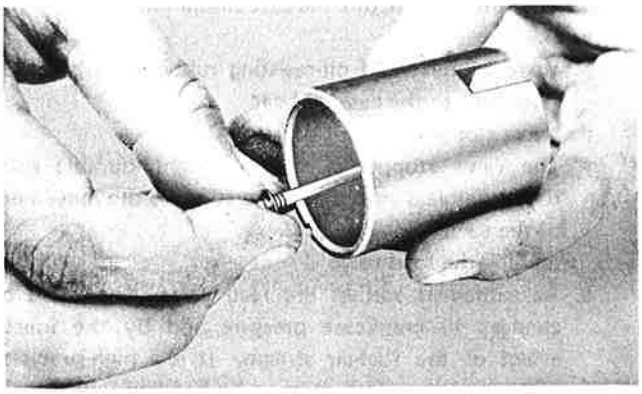


Fig. 4-2-23

	DT250B	DT400B
Jet Needle Type:	5F21-4	6DH2-3
Clip Position:	4	3

4. Check throttle valve (slide) for signs of wear. Insert into carburetor body and check for free movement. If slide, or body, is out of round causing slide to stick, replace.
5. Install throttle valve and needle assembly in carburetor mixing chamber. Tighten mixing chamber top as tight as possible by hand.
   Do not use pliers or vice-grips as they may deform the mixing chamber shape, causing the throttle valve to stick during operation.
6. Install the mixing chamber top cover and all overflow and vent tubes. Re-install carburetor.
   Check position and routing of all tubes. Check tightness of all fittings. Make sure carburetor is mounted in a level position.
7. After installation, re-adjust throttle cable and Autolube pump cable per directions in CHAPTER 2 Section 3-A, and C.

4-3. Reed valve assembly

A. Description

1. Yamaha has designed a unique stainless steel reed valve located between the carburetor and cylinder. The valve works independently on a demand basis. There's no mechanical device, such as a rotary valve or piston skirt to govern its opening and closing.
2. Construction of reed valve assembly.
   a. Valve
      The valve is made of special flexible stainless steel and designed to open and close the inlet port.
   b. Case
      The case is made of a die-cast aluminum alloy.
   c. Gasket
      Made of heat and oil-resisting rubber, the gasket is "welded" to the case by heat.
   d. Valve stopper
      The valve stopper is made of highly-durable cold-rolled stainless steel plate, and controls the movement of the valve.
3. Handling the reed valve
   a. As explained earlier, the reed valve is operated by changes in crankcase pressure and by the inertia effect of the fuel-air stream. It is a high-precision piece, and therefore, it must be handled with special care.
4. Storage
   a. The reed valve must be stored in a clean and dry place and must not be exposed to the sun. Particularly, it must be kept free from salt. Avoid touching the valve.

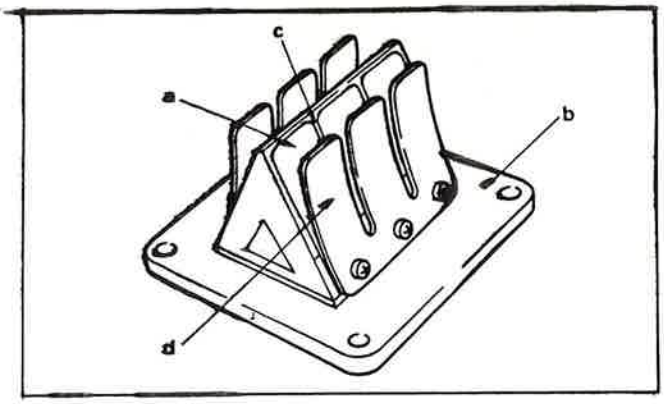


Fig. 4-3-1

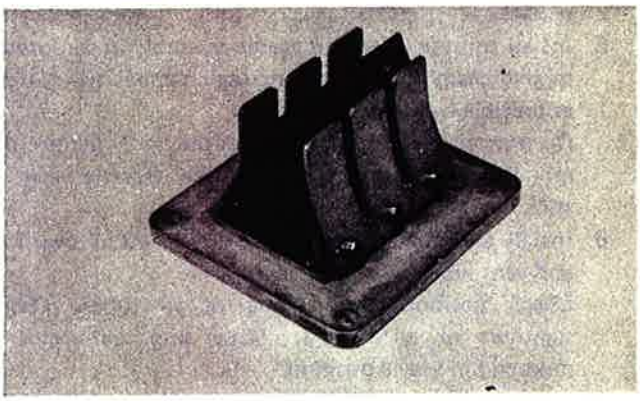


Fig. 4-3-2

B. Removal and troubleshooting

With carburetor removed, proceed as follows:

1. Remove the bolts (4) holding the intake manifold and reed valve assembly to cylinder.
   Remove assembly.
2. Inspect rubber intake manifold for signs of weathering, checking or other deterioration.
3. Inspect reed petals for signs of fatigue cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be slight to moderate.

4. If disassembly of the reed valve assembly is required, proceed as follows:
   a. Remove Phillips screws (3) securing stopper plate and reed to reed block. Handle reed carefully. Avoid scratches and do not bend.
   Note from which side of the reed block the reed and stopper plate were removed. Re-install on same side.

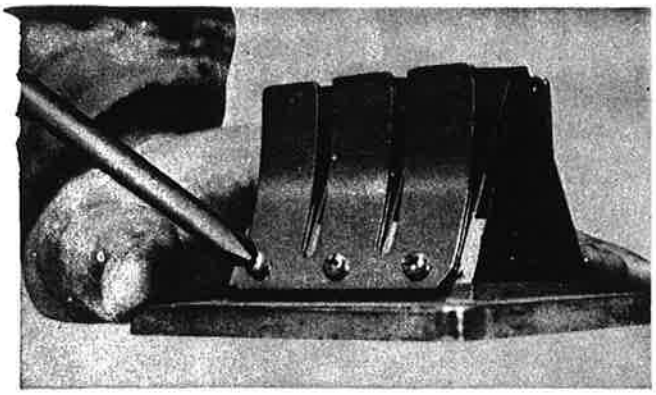


Fig. 4-3-3

   b. During reassembly, clean reed block, reed, and stopper plate thoroughly. Apply a holding agent, such as "Lock-Tite," to threads of Phillips screws. Tighten each screw gradually to avoid warping.

Torque: 0.32 in -lbs. (8.0 cm-kg.)

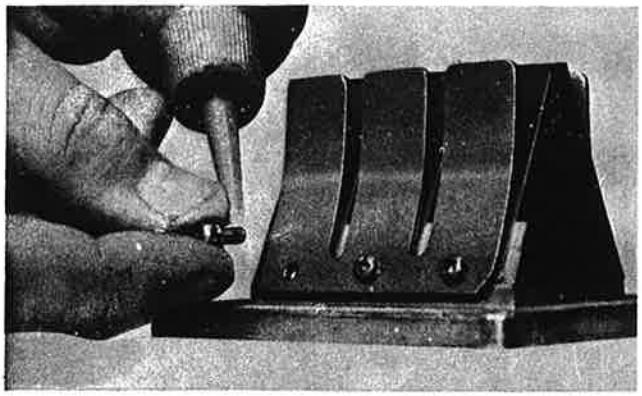


Fig. 4-3-4

Note:
During reassembly, note the cut in the lower corner of the reed and stopper plate. Use as aid to direction of reed installation.

5. During reassembly of the reed valve assembly and manifold, install new gaskets and torque the securing bolts gradually and in pattern. Tighten thoroughly.

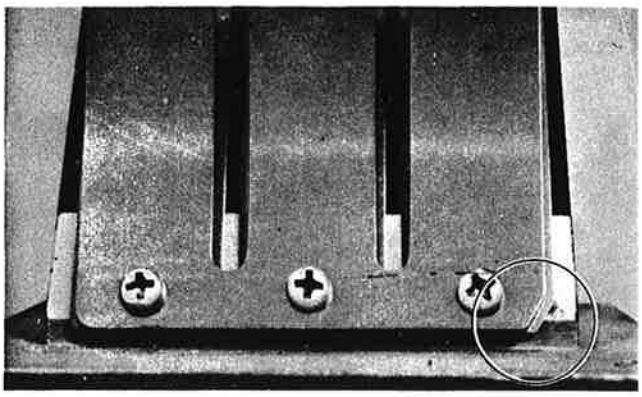


Fig. 4-3-5

CHAPTER 5. CHASSIS

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5

5-1. Front wheel

A. Removal

1. Disconnect the brake cable at the front brake lever. (Fig. 5-1-1)
2. Disconnect the brake cable at the front wheel backing plate. (Fig. 5-1-2)
3. Disconnect the speedometer cable from the front wheel backing plate. (Fig. 5-1-3)
4. Remove cotter pin from front axle. (Fig. 5-1-4)
5. Remove the front axle nut. (Fig. 5-1-5)
6. Loosen the two axle holder nuts, at the bottom of the right-hand fork leg. (Fig. 5-1-6)
7. Remove the front wheel axle by simultaneously twisting and pulling out on the axle. Then remove the wheel assembly.
   (Raise the front of the machine by placing a suitable stand under the engine.) (Fig. 5-1-7)

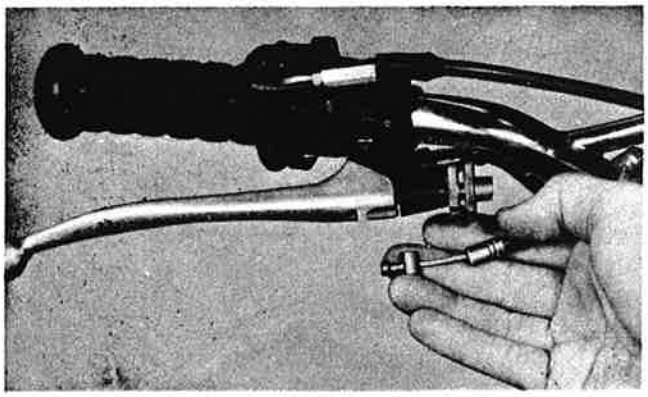


Fig. 5-1-1

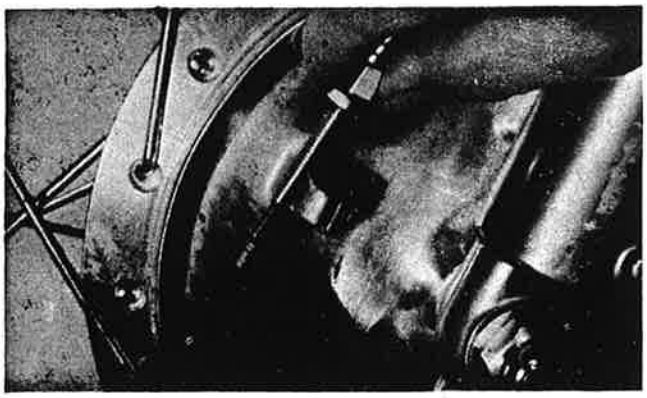


Fig. 5-1-2

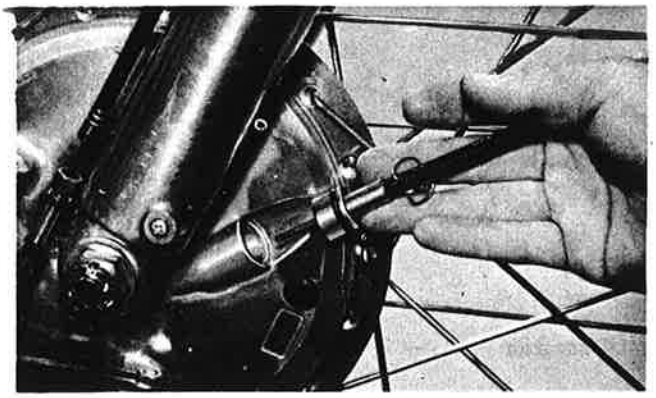


Fig. 5-1-3

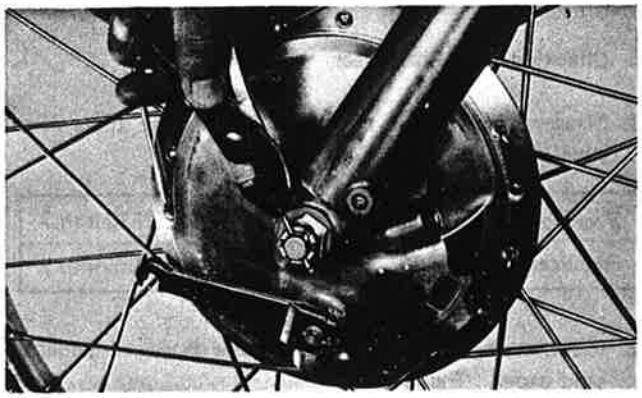


Fig. 5-1-4

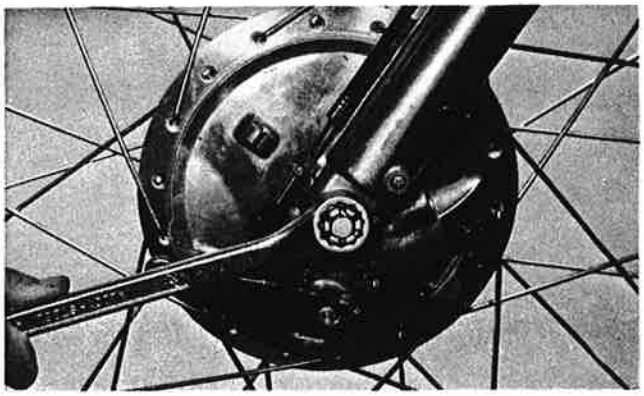


Fig. 5-1-5

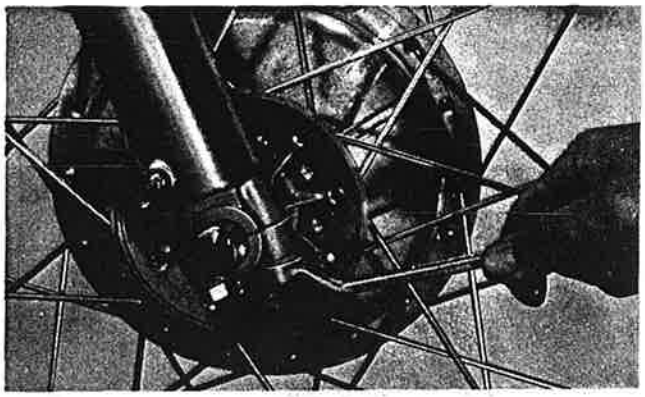


Fig. 5-1-6

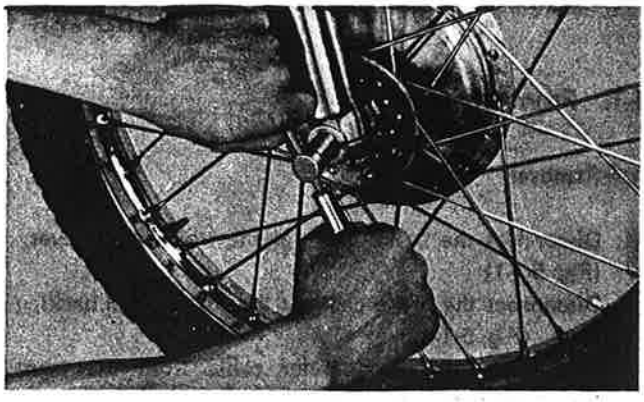


Fig. 5-1-7

B. Front axle

Remove any corrosion from axle with emery cloth. Then place it on a surface plate and check for bending If bent, replace.

C. Checking brake shoe wear

1. Measure the outside diameter at the brake shoes with slide calipers. (Fig. 5-1-8)

Front brake shoe diameter:	6.30 ins. (160 mm.)
Replacement limit:	6.10 ins. (155 mm.)

2. Remove any glazed areas from brake shoes using coarse sand paper. (Fig. 5-1-9)

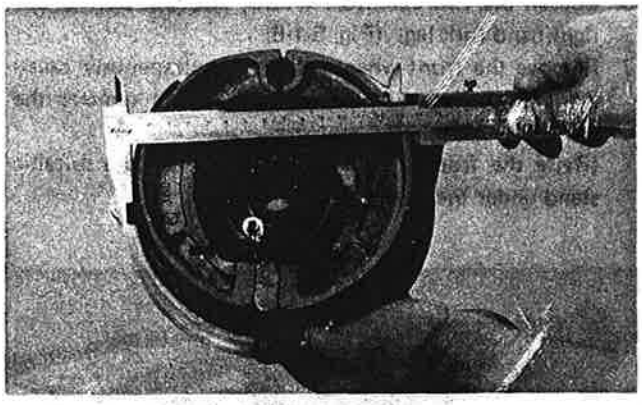


Fig. 5-1-8

Fig. 5-1-9

D. Brake drum

Oil or scratches on the inner surface or the brake drum will impair braking performance or result in abnormal noises. Remove oil by wiping with a rag soaked in lacquer thinner or solvent. Remove scratches by lightly and evenly polishing with emery cloth. (Fig. 5-1-10)

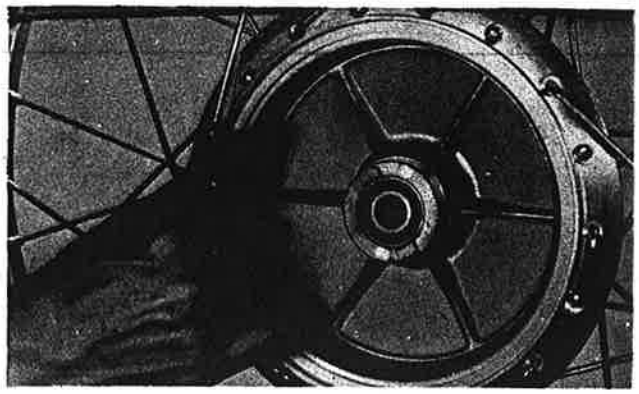
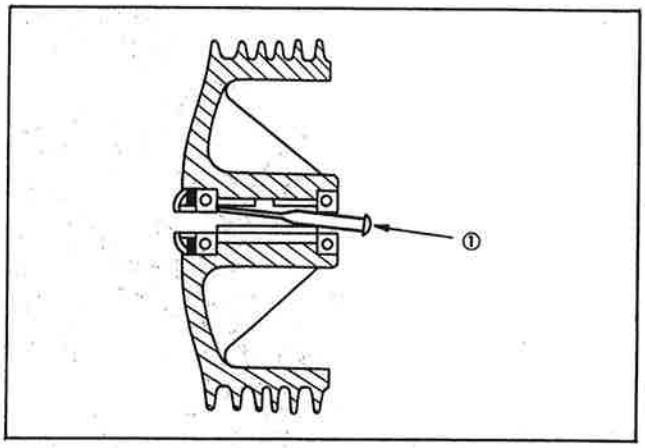


Fig. 5-1-10

E. Replacing wheel bearings

If the bearings allow play in the wheel hub or if wheel does not turn smoothly, replace the bearings as follows:

1. First Clean the outside of the wheel hub.
2. Drive the bearing out by pushing the spacer aside (the spacer "floats" between the bearings) and tapping around the perimeter of the bearing inner race with a soft metal drift pin and hammer. Either or both bearings can be removed in this manner. (Fig. 5-1-11)
3. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation. Use a socket that matches the outside race of the bearing as a tool to drive in the bearing.



1. Tap here

Fig. 5-1-11

F. Installing front wheel

1. After replacing wheel and axle, tighten axle nut FIRST and install a new cotter pin.

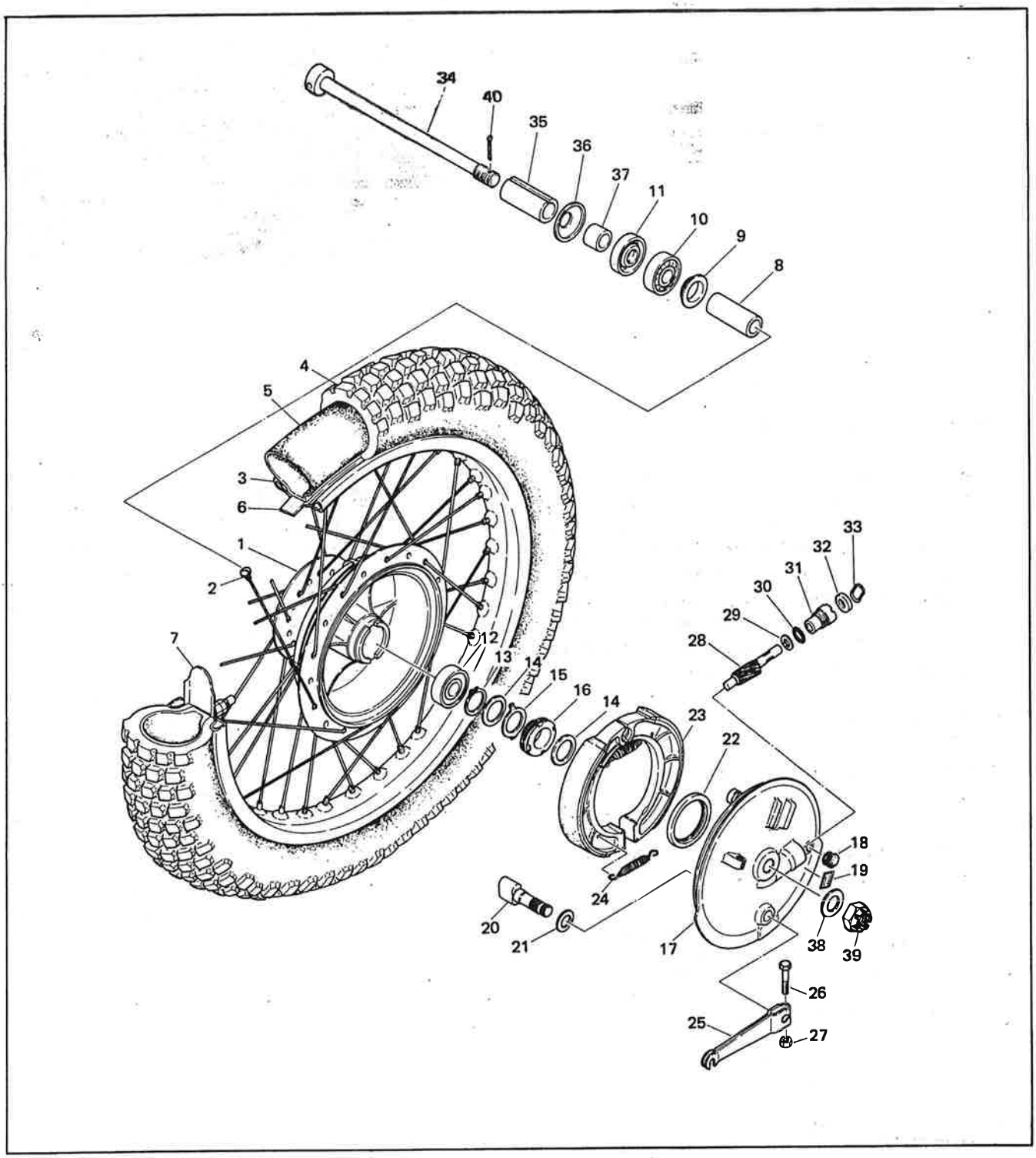
Note:
Align the groove of the spacer and the surface of the holder.

Axle nut torque:	900 ~ 1,100 in-lbs. (10 ~ 12 m-kgs.)

2. Then tighten the axle holder nuts.

Holder nut torque:	175 in-lbs. (2.0 m-kgs.)

3. Connect front brake cable and speedometer cable.



1. Front hub
2. Spoke set
3. Front rim
4. Front tire
5. Front tube
6. Rim band
7. Bead spacer
8. Bearing spacer
9. Space flange
10. Bearing
11. Oil seal
12. Bearing
13. Circlip
14. Plate washer
15. Meter clutch
16. Drive gear
17. Brake shoe backing plate
18. Grommet
19. Indicator label
20. Camshaft
21. Camshaft shim
22. Oil seal
23. Brake shoe complete
24. Tension spring
25. Camshaft lever
26. Bolt
27. Nut
28. Meter gear
29. Plate washer
30. O-ring
31. Bushing
32. Oil seal
33. Stop ring
34. Wheel axle
35. Collar
36. Dust hub cover
37. Collar
38. Plain washer
39. Castle nut
40. Cotter pin

Fig. 5-1-12

5-2. Rear wheel

A. Removal

1. Remove the tension bar and brake rod from rear shoe plate. (Fig. 5-2-1)
2. Disconnect the drive chain.
3. Remove cotter pin from rear axle.
4. Remove the rear axle nut. (Fig. 5-2-2)
5. Pull out the rear axle by simultaneously twisting and pulling out.
   (For this step, elevate the wheel by placing a suitable stand under the engine.)
6. Remove the rear wheel assembly. (Fig. 5-2-3)

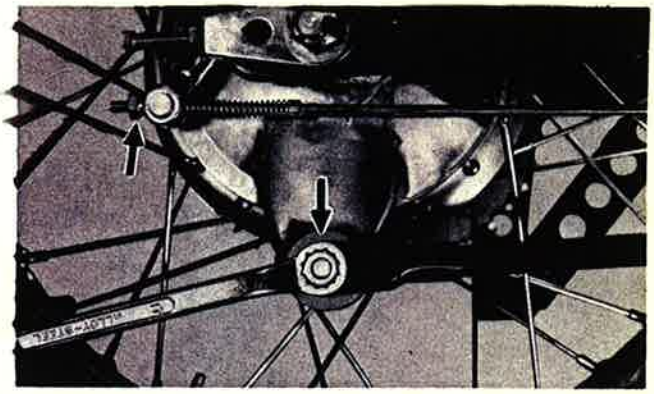


Fig. 5-2-1

B. Checking brake shoe wear

See front wheel section, paragraph 5-1, C.

Rear brake shoe diameter:	5.90 ins. (150 mm.)
Replacement limit:	5.70 ins. (145 mm.)

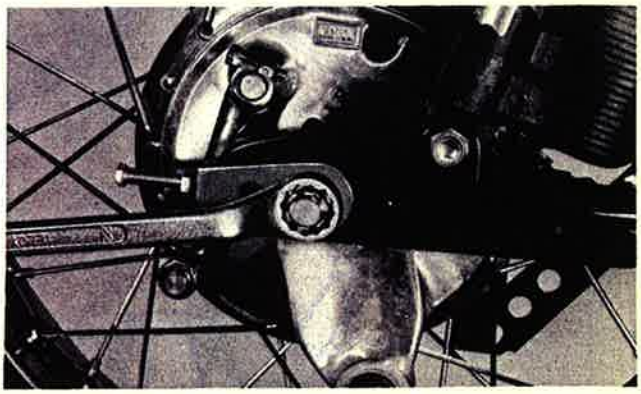


Fig. 5-2-2

C. Brake drum

See front wheel seciton, paragraph 5-1, D.

D. Replacing wheel bearings

See front wheel section, paragraph 5-1, E.

E. Installing rear wheel

1. Install wheel and axle, and tighten axle nut.

Axle nut torque:	900 ~ 1,100 in -lbs. (10 ~ 12 m-kgs.)

2. Connect drive chain, brake rod and tension bar.
3. Adjust drive chain. (See chapter 2, paragraph 4, D.)
4. Adjust rear brake. (See chapter 2, paragraph 4, C.)

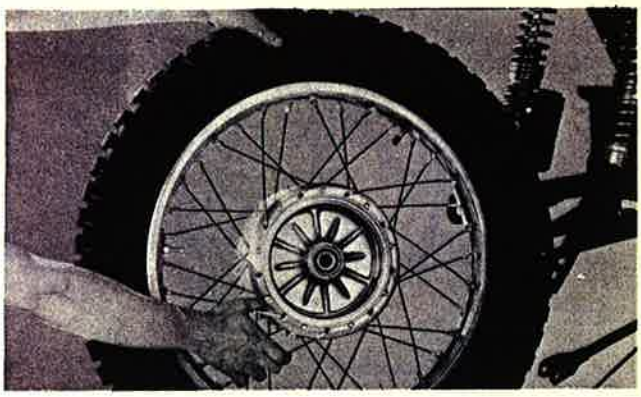
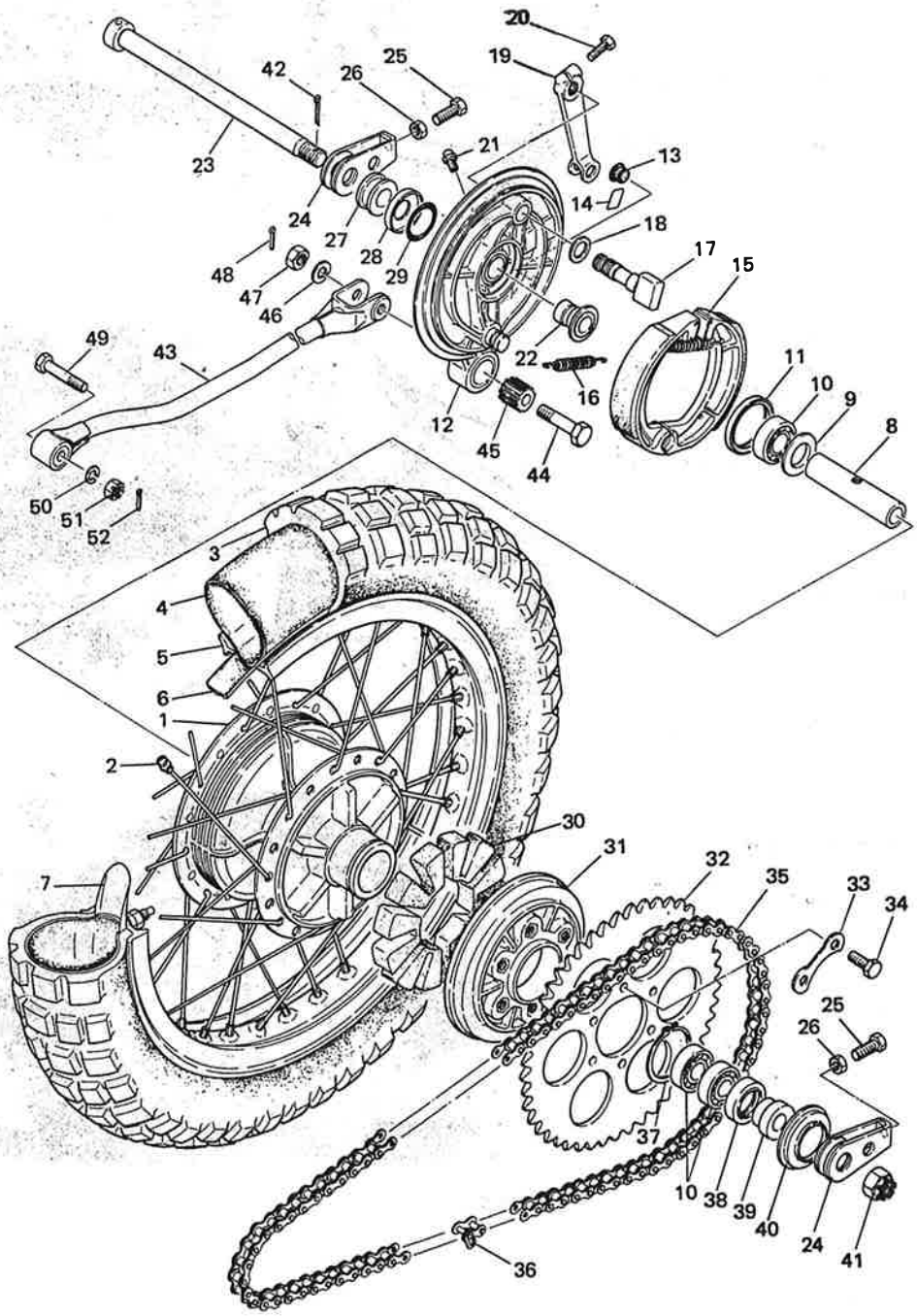


Fig. 5-2-3



1. Rear hub
2. Spoke set
3. Rear tire
4. Rear tube
5. Rear rim
6. Rim band
7. Bead spacer
8. Bearing spacer
9. Spacer flange
10. Bearing
11. Oil seal
12. Brake shoe backing plate
13. Grommet
14. Indicator label
15. Brake shoe complete
16. Tension spring
17. Camshaft
18. Shim
19. Camshaft lever
20. Bolt
21. Grease nipple
22. Bushing
23. Wheel axle
24. Chain puller
25. Chain puller bolt
26. Nut
27. Collar
28. Dust plate cover
29. O-ring
30. Clutch damper
31. Hub clutch
32. Rear sprocket
33. Lock washer
34. Fitting bolt
35. Chain
36. Chain joint
37. Circlip
38. Oil seal
39. Axle collar
40. Dust cover
41. Axle nut
42. Cotter pin
43. Tension bar
44. Pin hole gexagon bolt
45. Bushing
46. Spring washer
47. Nut
48. Cotter pin
49. Pin hole hexagon bolt
50. Spring washer
51. Slotted nut
52. Cotter pin

Fig. 5-2-4

5-3. Rims and spokes (Front and rear wheels)

A. Checking for loose spokes

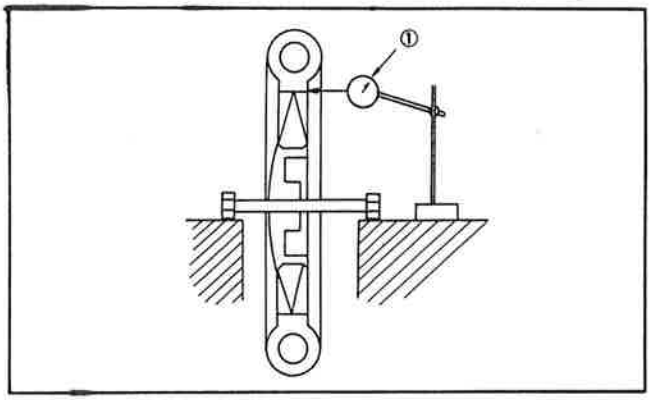
Loose spokes can be checked by bracing the machine off the ground so that the wheel can spin free. Slowly revolve the wheel and at the same time let the metal shaft of a fairly heavy screwdriver bounce off each spoke. If all the spokes are tightened approximately the same then the sound given off by the screwdriver hitting the spokes should sound the same. If one spoke makes a dull flat sound, then check it for looseness.

B. Checking rim "run-out"

While you have the wheel elevated, you should check that it does not have too much run-out. "Run-out" is the amount the wheel deviates from a straight line as it spins. Spin the wheel, and solidly anchor some sort of a pointer about 1/8 ins. away from the side of the rim.

As the wheel spins, the distance between the pointer and the rim should not change more than 1/16 ins. total. Any greater fluctuation should be eliminated by properly adjusting the spokes.

Run-out limits:	0.08 in. (2 mm.) lateral
Run-out limits:	0.08 in. (2 mm.) vertical



1. Dial gauge

Fig. 5-3-1

5-4. Tires and tubes

A. Removal

1. Remove valve cap, valve core, and valve stem lock nut. Loosen bead spacer(s), (rim locks).
2. When all air is out of tube, separate tire bead from rim, (both sides) by stepping on tire with your foot.
3. Use two tire removal irons (with rounded edges) to work the tire bead over the edge of the rim, starting 180° opposite the tube stem. Take care to avoid pinching the tube as you do this.
4. After you have worked one side of the tire completely off the rim, then you can slip the tube out. Be very careful not to damage the stem while pushing it back out of the rim hole.

Note:

If you are changing the tire itself, then finish the removal by working the second bead off the rim.

B. Installation

Reinstalling the tire and tube can be accomplished by reversing the disassembly procedure. The only difference in procedure would be right after the tube has been installed, but before the tire has been completely slipped onto the rim, momentarily inflate the tube. This removes any creases that might exit. Release the air and continue with reassembly. Also, right after the tire has been completely slipped onto the rim, check to make sure that the stem comes out of the hole in the rim at a right angle to the rim. Finally, inflate the tire and tighten the bead spacer securing nut(s).

Tire Pressure	Front:	17 lbs/in.^{2} (1.2 kg/cm.^{2})	Normal Riding
	Rear:	21 lbs/in.^{2} (1.5 kg/cm.^{2})	

5-5. Drive chain and sprockets

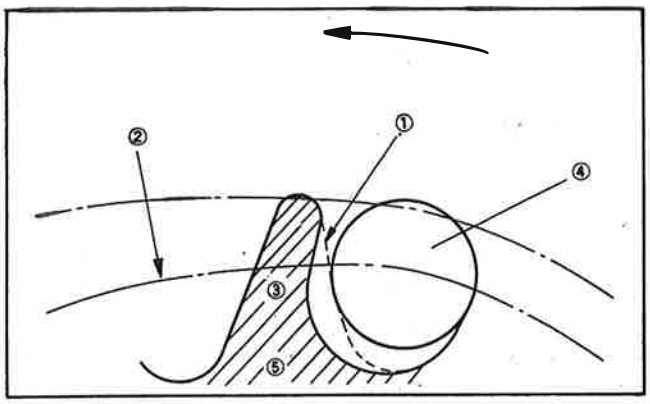
Note:

Please refer to Maintenance Intervals and Lubrication Intervals charts for additional information.

A. Drive sprocket

With the left crankcase cover removed, proceed as follows:

1. Using a blunt chisel, flatten the drive sprocket lock washer tab.
2. With the drive chain in place, transmission in gear, firmly apply the rear brake. Remove the sprocket securing nut. Remove the sprocket.
3. Check sprocket wear. Replace if wear decreases tooth width as shown. (Fig. 5-5-1)

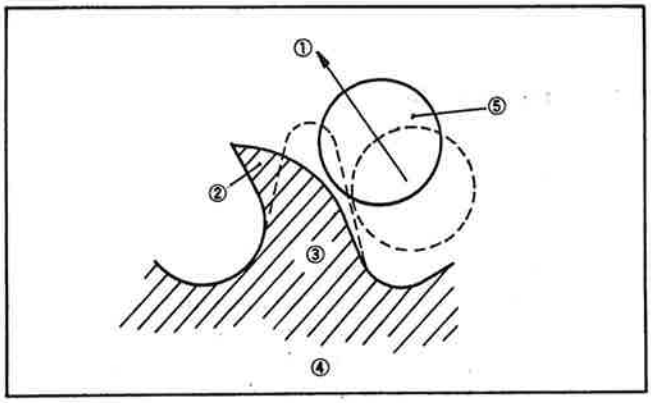


1. Correct
2. Replace
3. Tooth
4. Roller
5. Sprocket

Fig. 5-5-1

4. Replace if tooth wear shows a pattern such as that in the illustration, or as precaution and common sense dictate. (Fig. 5-5-2)
5. During reassembly, make sure the lock washer splines are properly seated on the drive shaft splines. Tighten securing nut thoroughly specified torque value. Bend lock washer tab fully against securing nut flats.

Drive Sprocket Securing Nut Torque:
608 ~ 781 in-lbs. (7.0 ~ 9.0 m-kgs.)



1. Slip off
2. Replace
3. Tooth
4. Sprocket
5. Roller

Fig. 5-5-2

B. Driven sprocket

With the rear wheel removed, proceed as follows:

1. Using a blunt chisel, flatten the securing bolt lock washer tabs.
   Remove the securing bolts. Remove the lock washers and sprocket. (Fig. 5-5-3)
2. Check sprocket wear per procedures for the drive sprocket.
3. Check the sprocket to see that it runs true. If bent, replace.

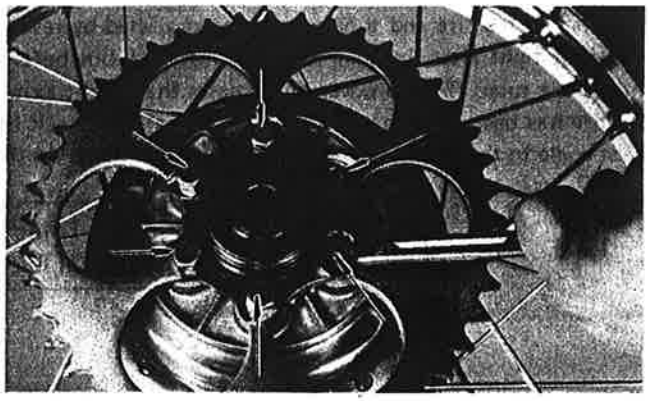


Fig. 5-5-3

4. During reassembly, make sure that sprocket and sprocket seat are clean. Tighten the securing bolts in a crisscross pattern.
   Bend the tabs of the lock washers fully against the securing bolt flats. (Fig. 5-5-4)

Driven Sprocket Securing Bolt Torque:
174 ~ 226 in-lbs. (2.0 ~ 2.6 m-kgs.)

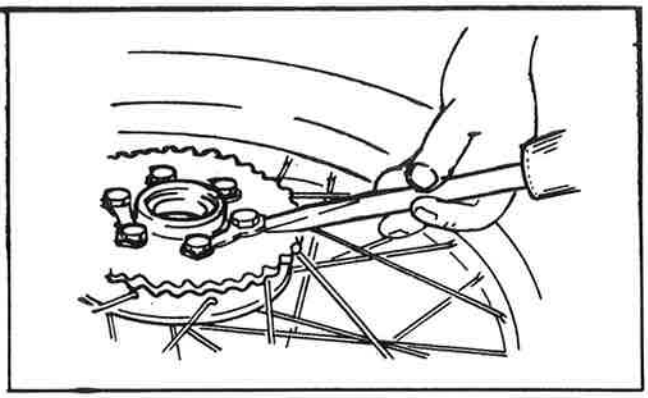
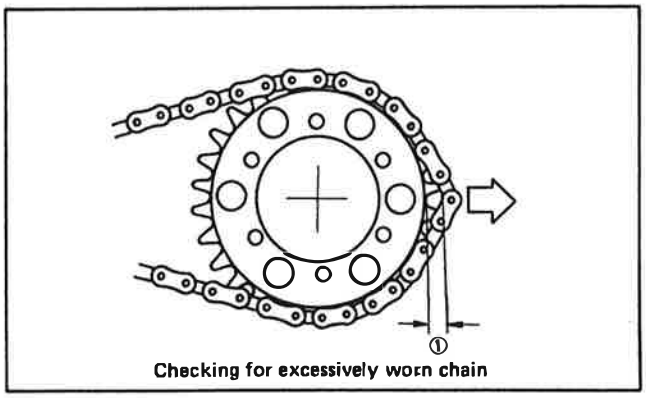


Fig. 5-5-4

C. Chain inspection

1. With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect.
   If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear, remove and inspect. (Fig. 5-5-5)



Checking for excessively worn chain

1. 1/2 tooth

Fig. 5-5-5

2. Check the chain for stiffness. Hold as illustrated. If stiff, soak in solvent solution, clean with wire bush, dry with high pressure air. Oil chain thoroughly and attempt to work out kinks. If still stiff replace. (Fig. 5-5-6)
3. Check the side plate for damage. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.

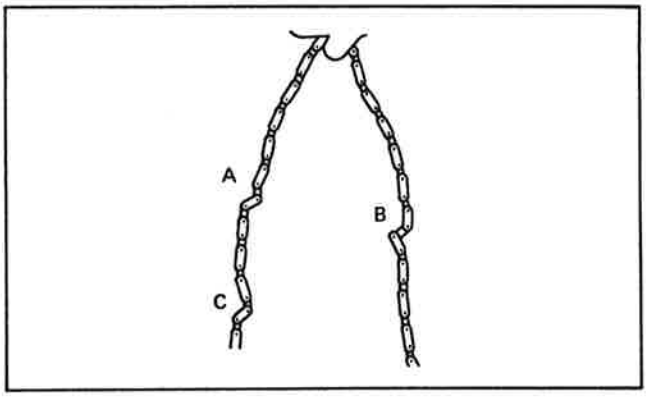


Fig. 5-5-6

D. Chain maintenance

The chain should be lubricated per the recommendations given in the Maintenance and Lubrication Intervals charts. More often if possible. Preferable after every use. See "Chassis and Suspension, Swing Arm", for additional information regarding chain guide.

1. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
2. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear. Apply thoroughly. Wipe off excess.

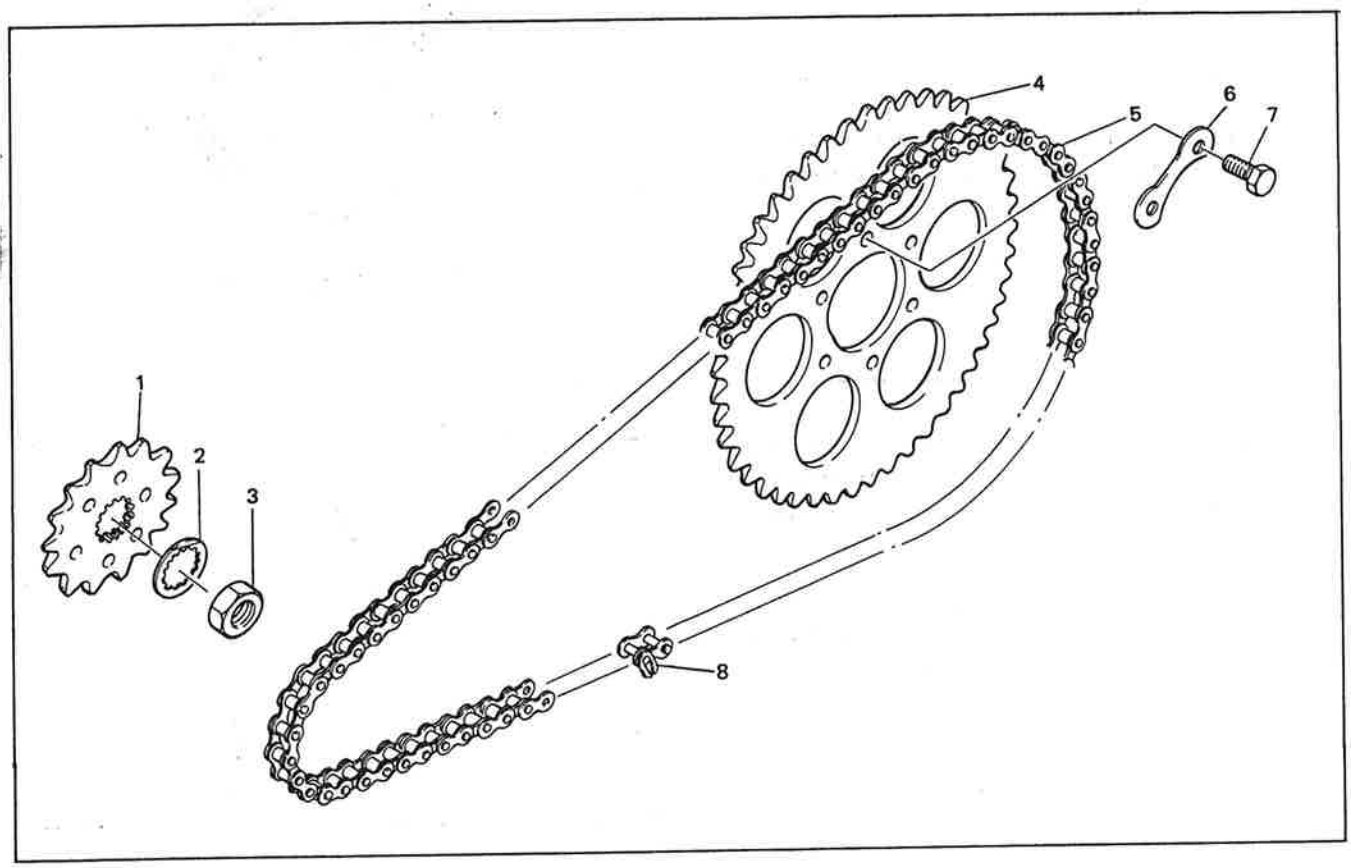
Note:

Chain and lubricant should be at room temperature to assure penetration of lubricant into rollers.

Choice of lubricant is determined by use and terrain. SAE 20wt. or 30wt. oil may be used, but several specialty types by accessory manufacturers offer more penetration, corrosion resistance for roller protection. In certain areas, semi-drying lubricants are preferable. These will resist picking up sand particles, dust, etc.

3. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
4. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.

Drive chain and sprockets



1. Drive sprocket
2. Lock washer
3. Lock nut
4. Driven (rear) sprocket
5. Chain
6. Lock washer
7. Fitting bolt
8. Chain joint

Fig. 5-5-7

5-6. Front forks

A. Disassembly

1. With the front wheel, speedometer cable and front brake cable removed, the fork legs can be removed from the upper and lower brackets by loosening upper and lower pinch bolts. (Fig. 5-6-1)

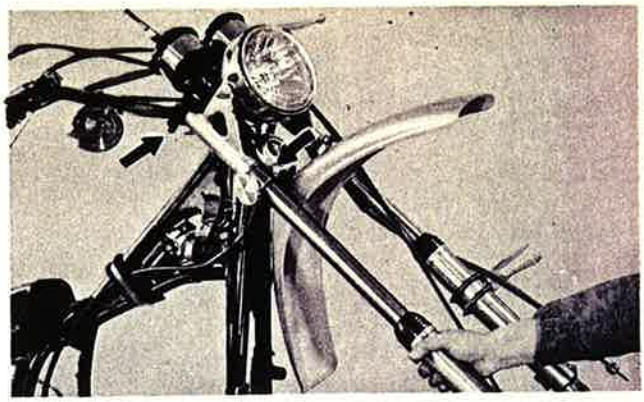


Fig. 5-6-1

2. Remove the caps and drain the oil from both fork tubes. (Fig. 5-6-2)

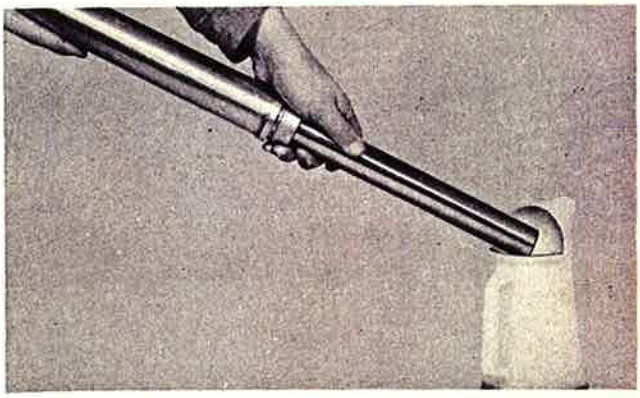


Fig. 5-6-2

3. Remove the special bolt from bottom of outer tubes. (Fig. 5-6-3)

Fig. 5-6-3

4. Remove inner tube and damper assembly from outer tube. (Fig. 5-6-4)

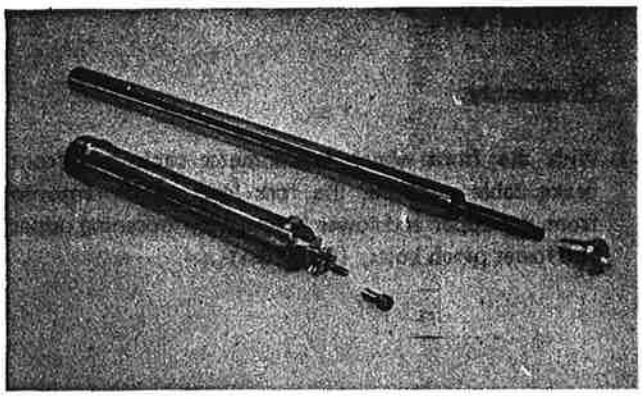


Fig. 5-6-4

5. Remove clip from bottom of inner tube and pull out damper assembly. Inspect and replace if damaged. (Fig 5-6-6)

Fig. 5-6-5

6. To replace fork seal, remove wire clip, felt ring and cover washer from outer tube. (Fig. 5-6-7)

Fig. 5-6-6

7. Carefully pry out old seal without damaging fork tube. (Fig. 5-6-7)

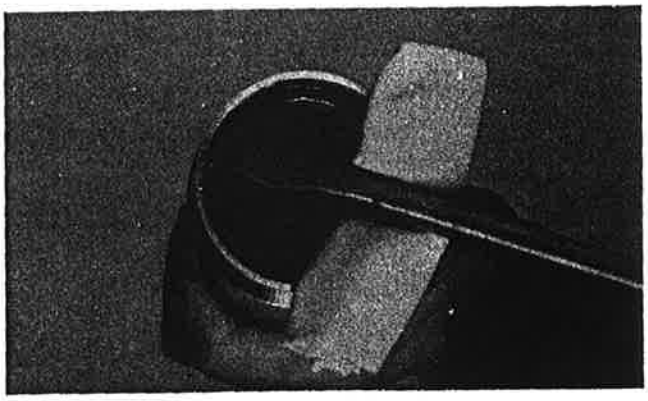


Fig. 5-6-7

B. Insert new seal "open" side down using large socket and soft hammer (Fig 5-6-8)

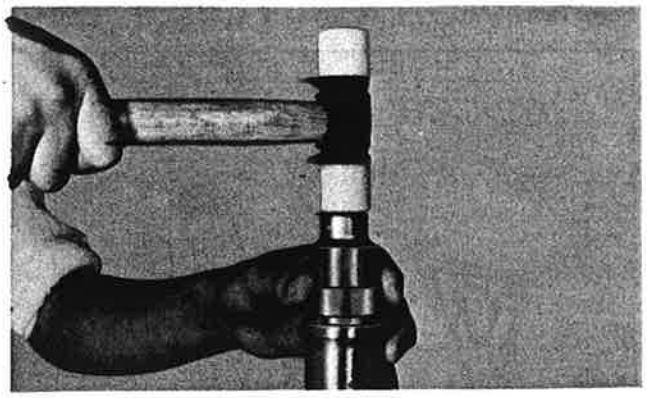


Fig. 5-6-8

B. Inspection

Inspect the inner tube for bends or scratches. If the bend is slight, it can be corrected with a press. It is recommended however, to replace the tube.

C. Assembly

1. When assembling the front fork, reverse the order of disassembly.
2. Installing the front forks.
   a. Bring up the front fork to the correct position and partially tighten the underbracket mounting bolt.
   b. Pour specified amount of oil into the inner tube through the upper end opening. Use 10W/30 "SE" motor oil.

Note:
Specialty type fork oils of quality manufacture may be used.

Fork oil capacity: 6 oz. (175 c.c.) per side

c. Install the inner tube caps.

Inner tube cap torque: 900 in-lbs. (10 m-kgs.)

d. Tighten all pinch bolts.

Pinch bolt torque: 70 ~ 100 in-lbs. (0.8 ~ 1.2 m-kgs.)

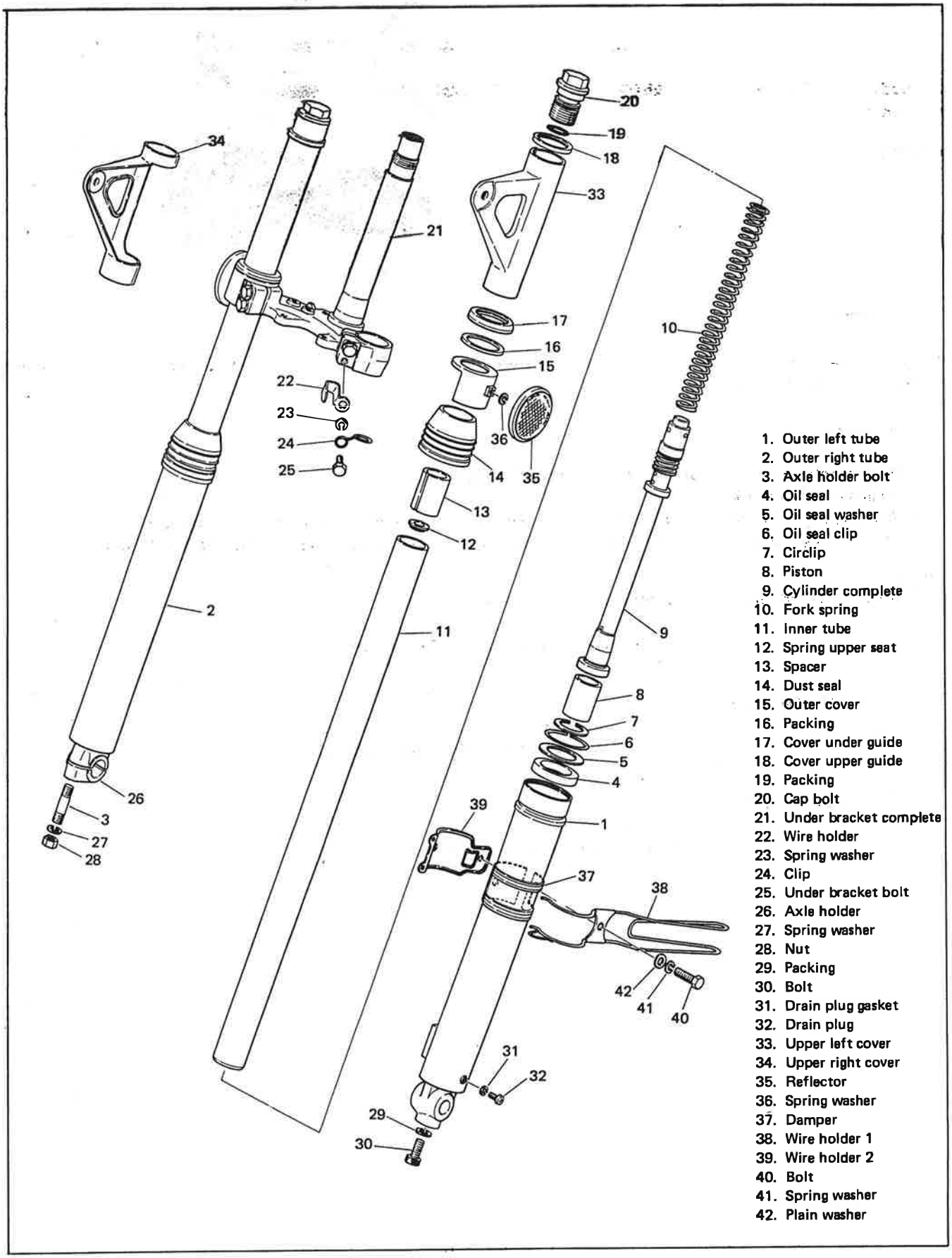

1. Outer left tube
2. Outer right tube
3. Axle holder bolt
4. Oil seal
5. Oil seal washer
6. Oil seal clip
7. Circlip
8. Piston
9. Cylinder complete
10. Fork spring
11. Inner tube
12. Spring upper seat
13. Spacer
14. Dust seal
15. Outer cover
16. Packing
17. Cover under guide
18. Cover upper guide
19. Packing
20. Cap bolt
21. Under bracket complete
22. Wire holder
23. Spring washer
24. Clip
25. Under bracket bolt
26. Axle holder
27. Spring washer
28. Nut
29. Packing
30. Bolt
31. Drain plug gasket
32. Drain plug
33. Upper left cover
34. Upper right cover
35. Reflector
36. Spring washer
37. Damper
38. Wire holder 1
39. Wire holder 2
40. Bolt
41. Spring washer
42. Plain washer

Fig. 5-6-9

5-7. Steering head

A. Adjustment

Refer to Chapter 2, Section 2-4, paragraph G for steering head adjustment procedure.

B. Disassembly

1. After removing front forks, remove headlight from headlight body. (Fig. 5-7-1)
2. Disconnect electrical wires between headlight body and main wiring harness from frame.

Note:
Removal of fuel tank will aid in disconnecting wiring.

3. Disconnect any electrical wires between handlebar switches and main wiring harness in headlight body.
4. Disconnect clutch and throttle cables at handlebars.
5. Disconnect tachometer and speedometer cables at instruments.

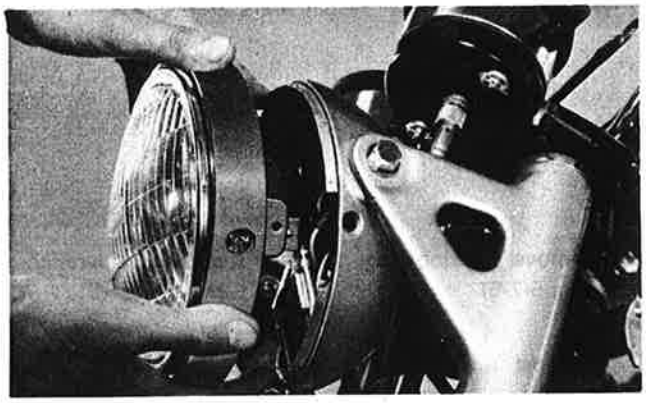


Fig. 5-7-1

6. Remove handlebars and put aside. (Fig. 5-7-2)

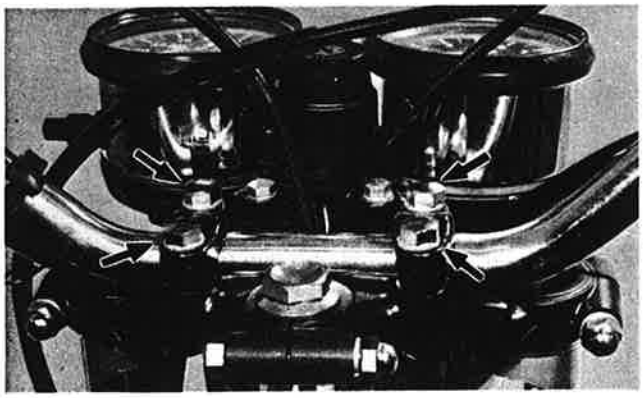


Fig. 5-7-2

7. Loosen stem pinch bolt. (Fig. 5-7-3)

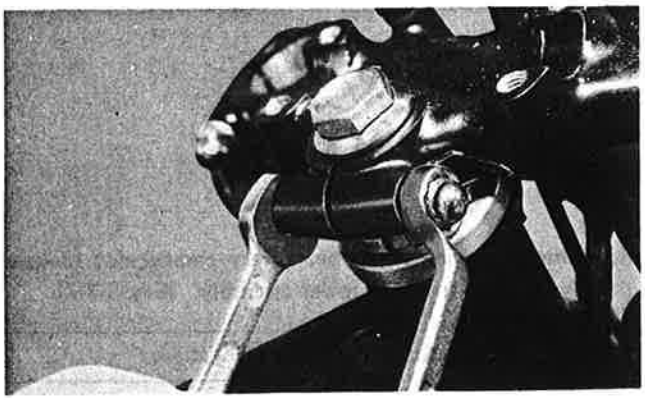


Fig. 5-7-3

8. Remove stem fitting bolt and crown washer. (Fig. 5-7-4)
9. Remove handle crown (upper bracket) and instruments, as an assembly.

Note:

Hold headlight body to keep it from falling.

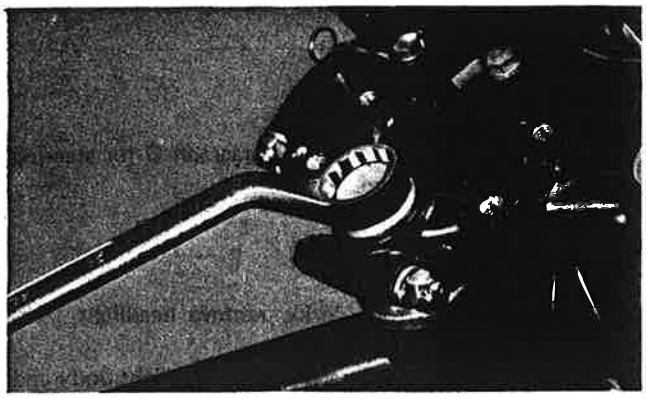


Fig. 5-7-4

10. Remove steering ring nut with steering nut wrench. (Fig. 5-7-5)

Caution:

Support under bracket with one hand to hold the bracket up into the headstock so that the loose bearings will not fall out.

11. While still supporting the under bracket, carefully lift off the upper bearing cover.

Fig. 5-7-5

12. Lift off the top bearing race and remove all of the ball bearings from the upper bearing assembly. (Fig. 5-7-6)

Ball quantity/size: 22 3/16 ins.

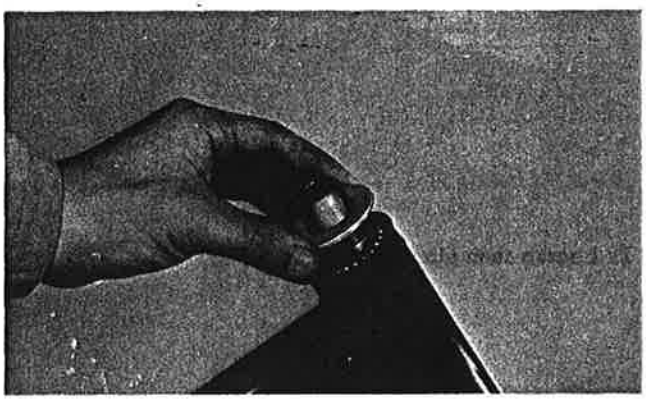


Fig. 5-7-6

13. Remove bracket while being very careful not to lose any bearings from the lower assembly. (Fig. 5-7-7)

Ball quantity/Size:	19 1/4 ins.

Fig. 5-7-7

14. Remove races from head pipe using drift punch and hammer as shown. Work the race out gradually by tapping lightly around its complete diameter. (Fig. 5-7-8)

Fig. 5-7-8

15. Remove the bearing race from the lower bracket by tapping around its diameter with a drift punch and hammer. (Fig. 5-7-9)

Note:
Remove dust seal.

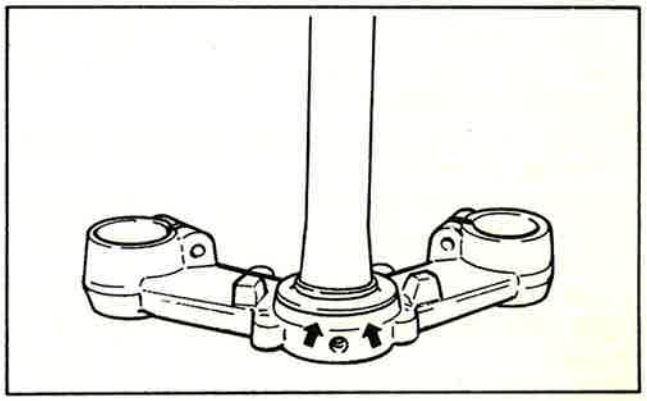


Fig. 5-7-9

C. Inspection

1. Examine all the balls for pits or partial flatness. If any one is found defective, the entire set (including both races) should be replaced. If either race is pitted, shows rust spots, or is damaged in any way, replace both races and all balls.
2. Examine dust seal under lowest race and replace if damaged.

D. Installation

1. If pressed-in races have been removed, tap in new races. (Fig. 5-7-10)

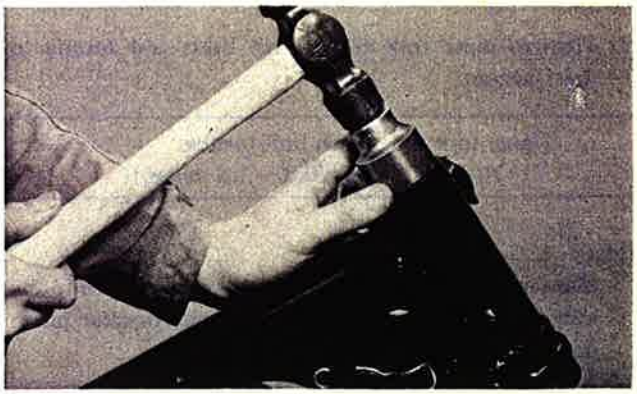


Fig. 5-7-10

2. Grease the lower ball race of the bottom assembly and arrange the balls around it. Then apply more grease. (Fig. 5-7-11)
3. Grease the lower ball race of the upper assembly and arrange the balls around it. Then apply more grease and set the top race into place. (Fig. 5-7-12)

Note:

Use medium-weight wheel bearing grease of quality manufacturer-preferrably waterproof.

4. Carefully slip the underbracket stem up into the steering head. Hold the top bearing assembly in place so the stem does not knock any balls out of position.
5. Set the upper bearing cover on and install the ring nut. Tighten the ring nut so that all freeplay is taken up, but so the bracket can still pivot freely from lock to lock. Recheck for free play after the entire fork unit has been installed. (Refer to Section 2-4, G for adjustment procedure.)
6. Install the fork tubes into the underbracket to ease headlight body installation.
7. Install the headlight body and stays onto the fork tubes with all rubber and steel spacing washers properly in place.
8. Install the upper fork bracket. Tighten steering fitting bolt then tighten stem pinch bolt. Torque to specification.

Steering fitting bolt:	
Stem pinch bolt:	140 ~ 200 in-lbs. (1.6 ~ 2.4 m-kgs.)

9. Tighten upper fork tube pinch bolts and torque to specification.

Upper fork tube pinch bolt torque: 70 ~ 100 in-lbs. (0.8 ~ 1.2 m-kgs.)

Note:

Make certain that tops of fork tubes are adjusted to the same level. If necessary, loosen underbracket pinch bolts and adjust.

10. Install handlebars and torque to specification.

Handlebars mounting bolt torque: 100 ~ 160 in-lbs. (1.1 ~ 1.8 m-kgs.)

11. Reconnect all electrical wiring and check operation.
12. Install headlight and check operation.
13. Install front wheel.
14. Reconnect speedometer and tachometer cables.
15. Reconnect clutch, front brake and throttle cables and check operation.

Fig. 5-7-11

Fig. 5-7-12

5-8. Swingarm

A. Swingarm inspection

1. With rear wheel and shock absorbers removed, grasp the ends of the arm and move from right to left to check for freeplay. (Fig. 5-8-1)

Swing arm freeplay: 0.04 in. (1.0 mm.)

2. If freeplay is excessive, remove swing arm and replace swing arm bushing.

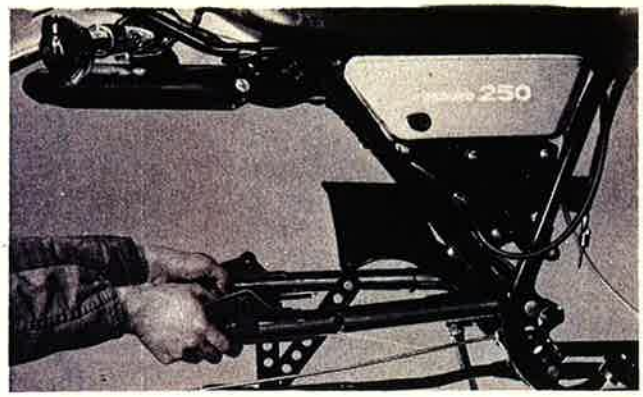


Fig. 5-8-1

B. Swing arm lubrication

1. Apply grease to grease fitting on top of pivot with low pressure hand operated gun. Apply until fresh grease appears at both ends of pivot shaft.

Recommended lubricant: Smooth chassis lube grease

2. Wipe off excess grease.

C. Swing arm removal

1. Remove nut on swing arm pivot bolt and tap out bolt with a long aluminum or brass rod. (Fig. 5-8-2)

Note:

Carefully remove the arm while noting the location of spacing washers and shims.

Pivot bolt torque:	862 ~ 955 in-lbs. (10 ~ 11 m-kgs.)

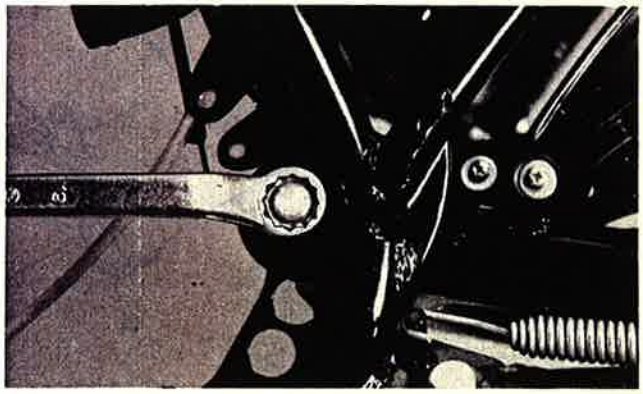


Fig. 5-8-2

2. Tap out old bushing from each side of pivot using the long rod. (Fig. 5-8-3)
3. Install new bushings using a press.

Note:

If tapping on bushing, bushing may be broken.

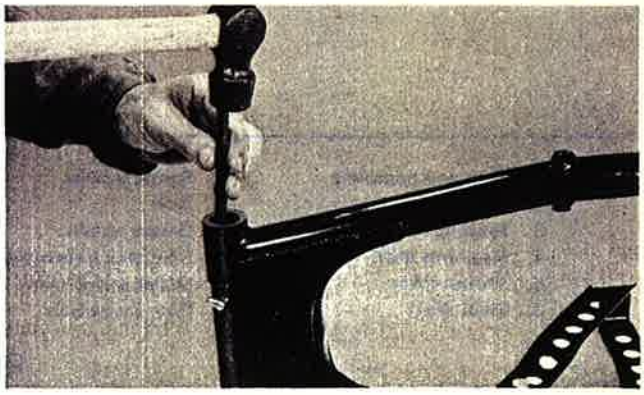
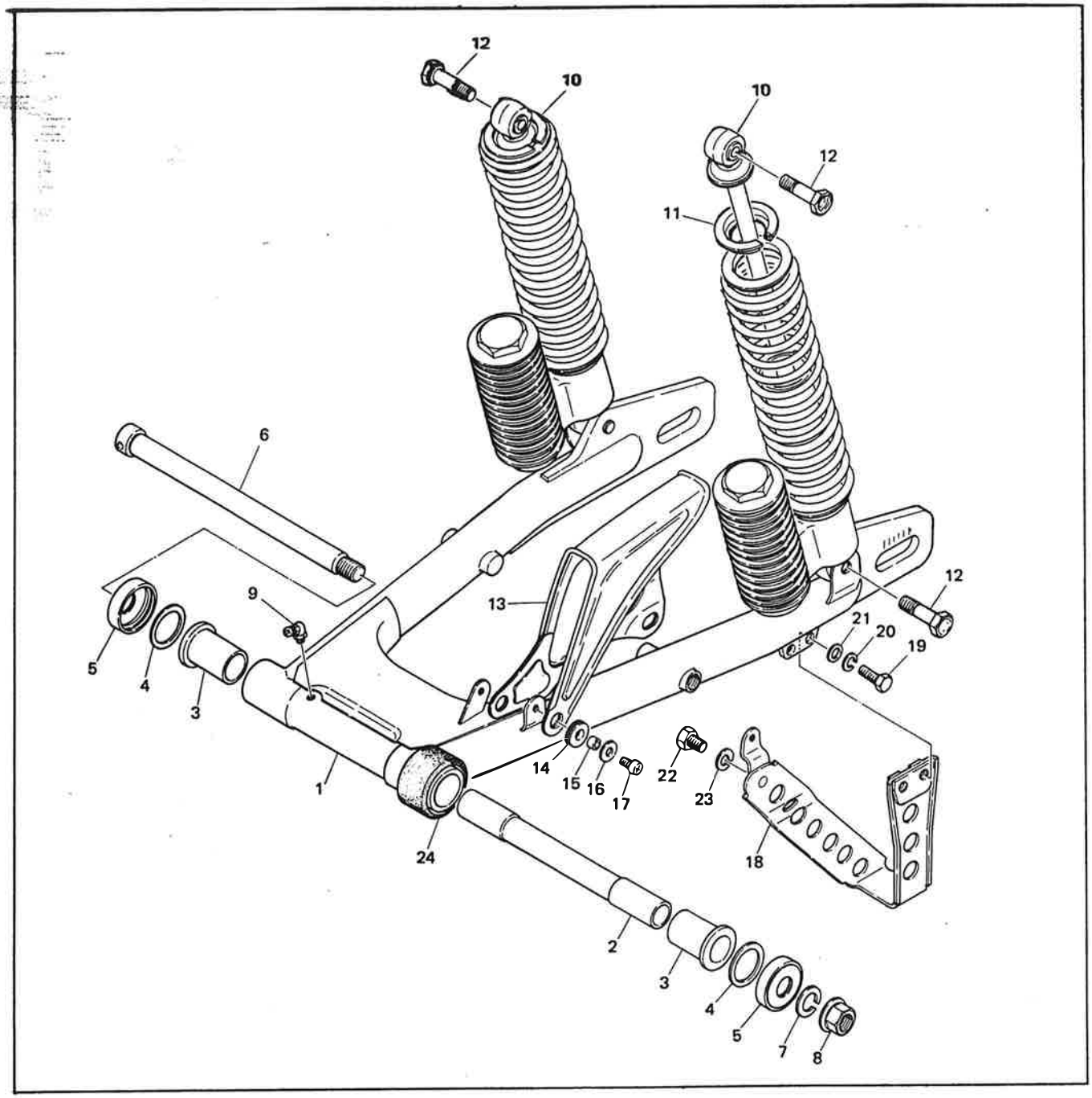


Fig. 5-8-3



1. Rear arm complete
2. Bushing
3. Bushing
4. Rear arm shim
5. Thrust cover
6. Pivot shaft
7. Spring washer
8. Nut
9. Grease nipple
10. Rear shock absorber
11. Upper spring seat
12. Rear shock bolt
13. Chain case
14. Grommet
15. Spacer
16. Plate washer
17. Pan head screw
18. Chain guard
19. Bolt
20. Spring washer
21. Plain washer
22. Bolt
23. Spring washer
24. Guard seal

Fig. 5-8-4

59. Cables and fittings

A. Cable maintenance

Note:

See Maintenance and Lubrication Intervals Charts for additional information.

Cable maintenance is primarily concerned with preventing deterioration through rust and weathering; and providing for proper lubrication to allow the cable to move freely within its housing.

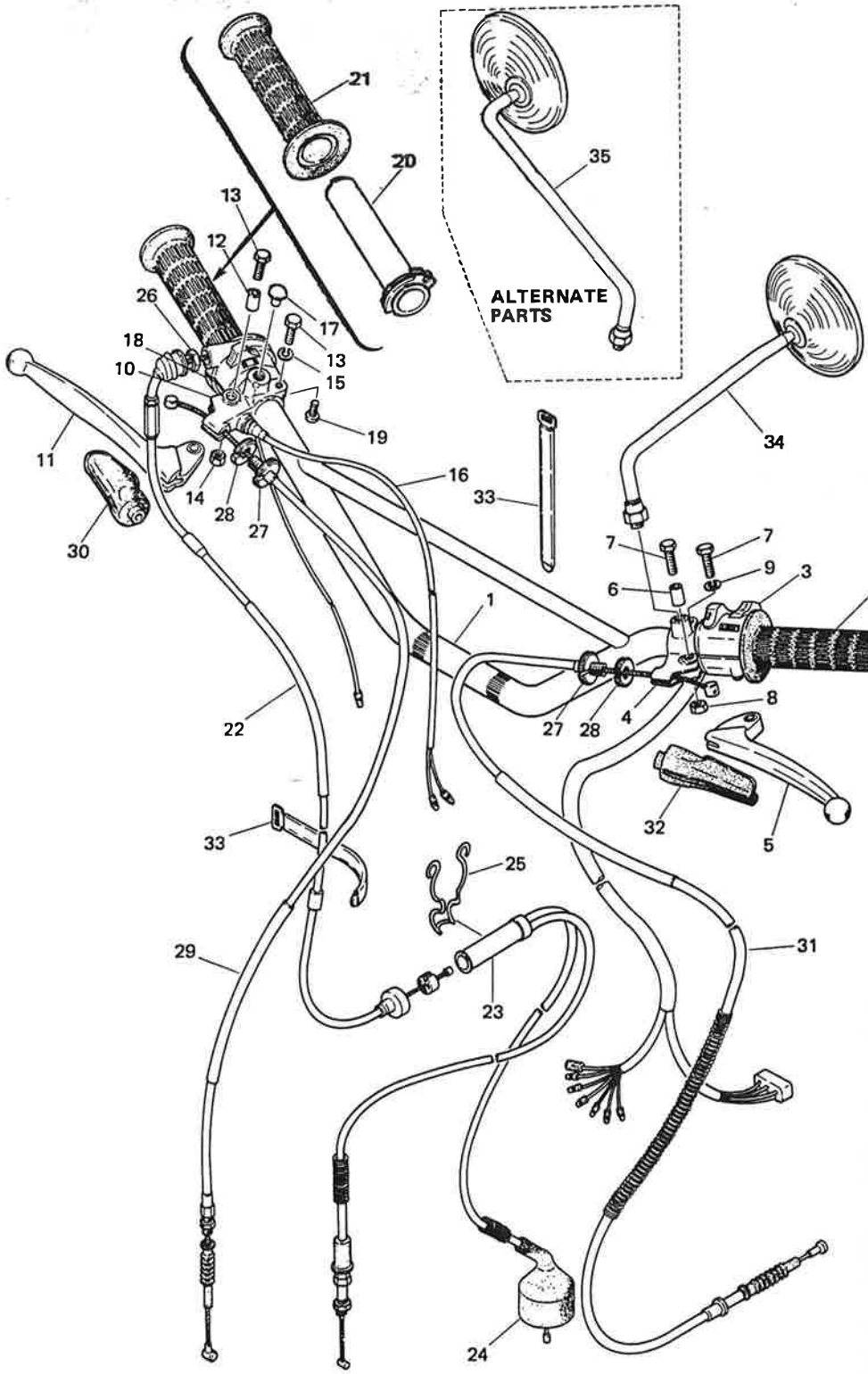
Cable removal is straight-forward and uncomplicated. Removal will not be discussed within this section. For details, see the individual maintenance section for which the cable is an integral part.

Cable routing is of paramount importance, however. For details of cable routing, see the cable routing diagrams at the end of this manual.

1. Remove the cable.
2. Check for free movement of cable within its housing. If movement is obstructed, check for fraying or kinking of the cable strands. If damage is evident, replace the cable assembly.
3. To lubricate cable, hold in vertical position. Apply lubricant to uppermost end of cable. Leave in vertical position until lubricant appears at bottom end. Allow excess to drain and re-install.

Note:

Choice of lubricant depends upon conditions and preference. However, a semi-drying chain and cable lubricant will probably perform adequately under most conditions.



1. Handle
2. Left grip
3. Handle switch 4
4. Left lever holder
5. Left lever
6. Lever collar
7. Bolt
8. Nut
9. Spring washer
10. Right lever holder
11. Right lever
12. Lever collar
13. Bolt
14. Nut
15. Front stop switch assembly
16. Spring washer
17. Plug
18. Handle switch 1
19. Pan head screw
20. Guide tube
21. Right grip
22. Throttle wire 1
23. Throttle wire 2
24. Rubber cap
25. Holder
26. Hexagon nut
27. Wire adjusting bolt
28. Nut
29. Front brake wire
30. Lever cover
31. Clutch wire
32. Lever cover
33. Band
34. Rear view mirror, left
35. Rear view mirror, right

Fig. 5-9-1

B. Throttle maintenance

1. Remove two Phillips head screws from throttle housing assembly and separate two halves of housing. (Fig. 5-9-2)
2. Disconnect cable end from throttle grip assembly and remove grip assembly.
3. Wash all parts in mild solvent and check contact surfaces for burrs or other damage. (Also clean and inspect right-hand end of handlebar.)
4. Lubricate contact surfaces with light coat of lithium soap base grease and reassemble.

Note:

Tighten housing screws evenly to maintain an even gap between the two halves.

5. Check for smooth throttle operation and quick spring return when released and make certain that housing does not rotate on handlebar.

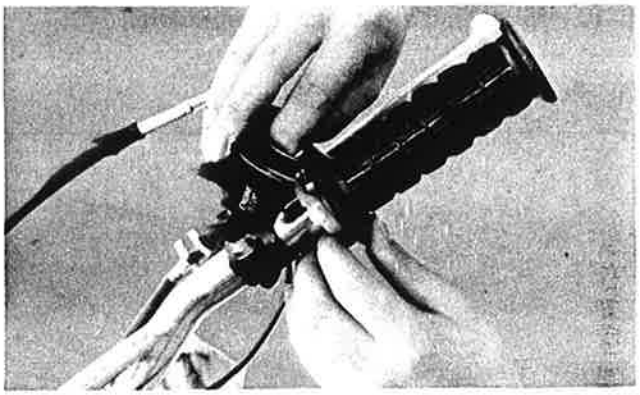


Fig. 5-9-2

C. Cable junction maintenance

The throttle cable cylinder (junction point for Autolube control cable) must be periodically maintained also.

1. Remove throttle cable number one from handlebar housing.
2. Remove throttle cable number two from carburetor mixing chamber top.
3. Remove Autolube pump cable from pump pulley. Remove cable adjustor.
4. Remove seat and fuel tank.
5. Remove cable/cylinder assembly complete.
6. Remove cylinder cap, throttle cable two and Autolube pump cable.
7. Wash assembly thoroughly in solvent.
8. Lubricate all associated cables.
9. Apply a thin coating of lubricant to cylinder walls.

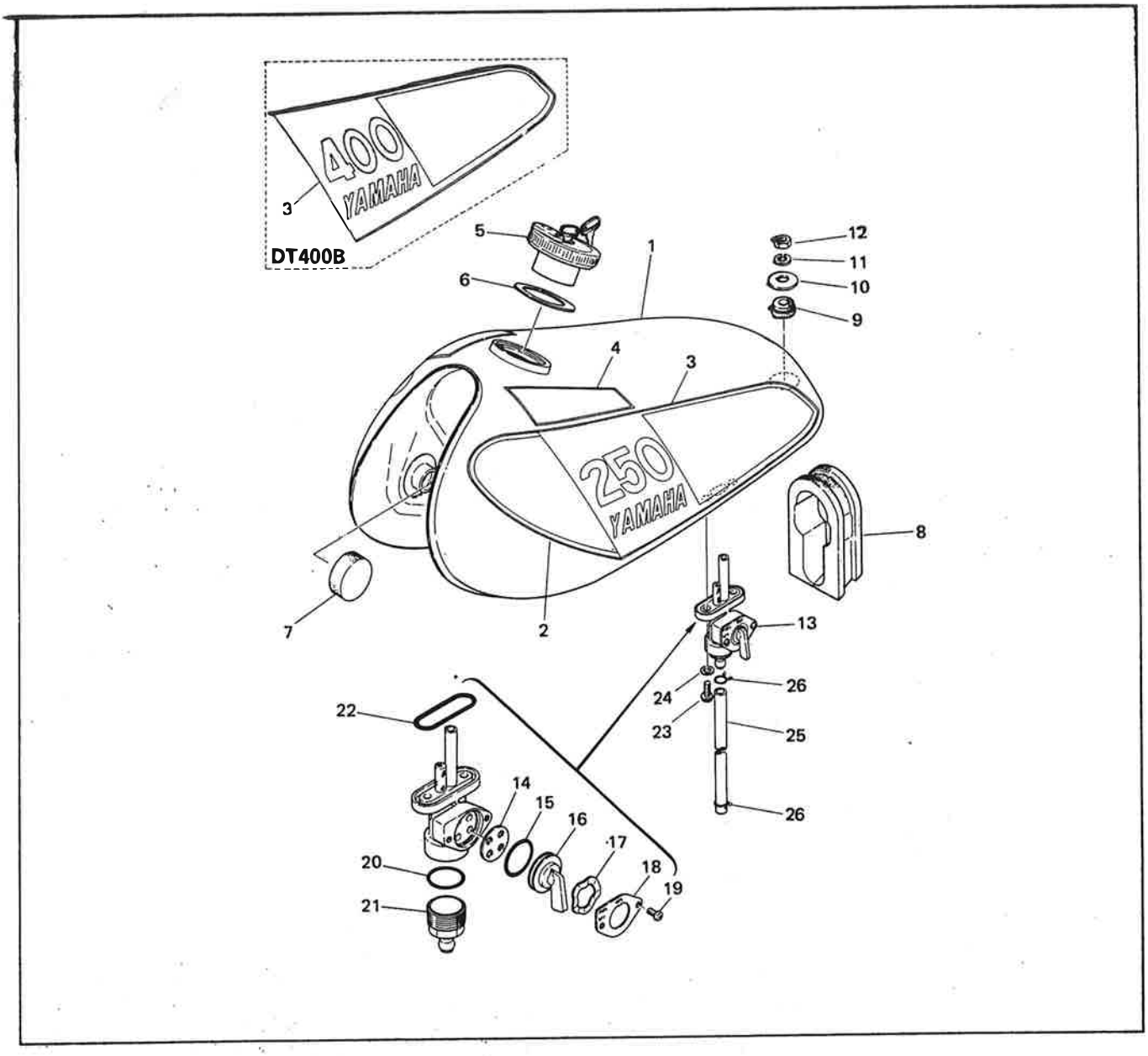
Note:

A small amount of lithium soap base grease may be used in lieu of cable lubricant. However, if machine is to be used in extreme cold, use the cable lubricant.

10. Reassemble all cables. Make sure cylinder is sealed from damage due to weather and riding conditions. Re-install.
    See cable routing diagrams for correct installation position. See Mechanical Adjustments Chapter for correct cable adjustment.

5-10. Miscellaneous chassis components

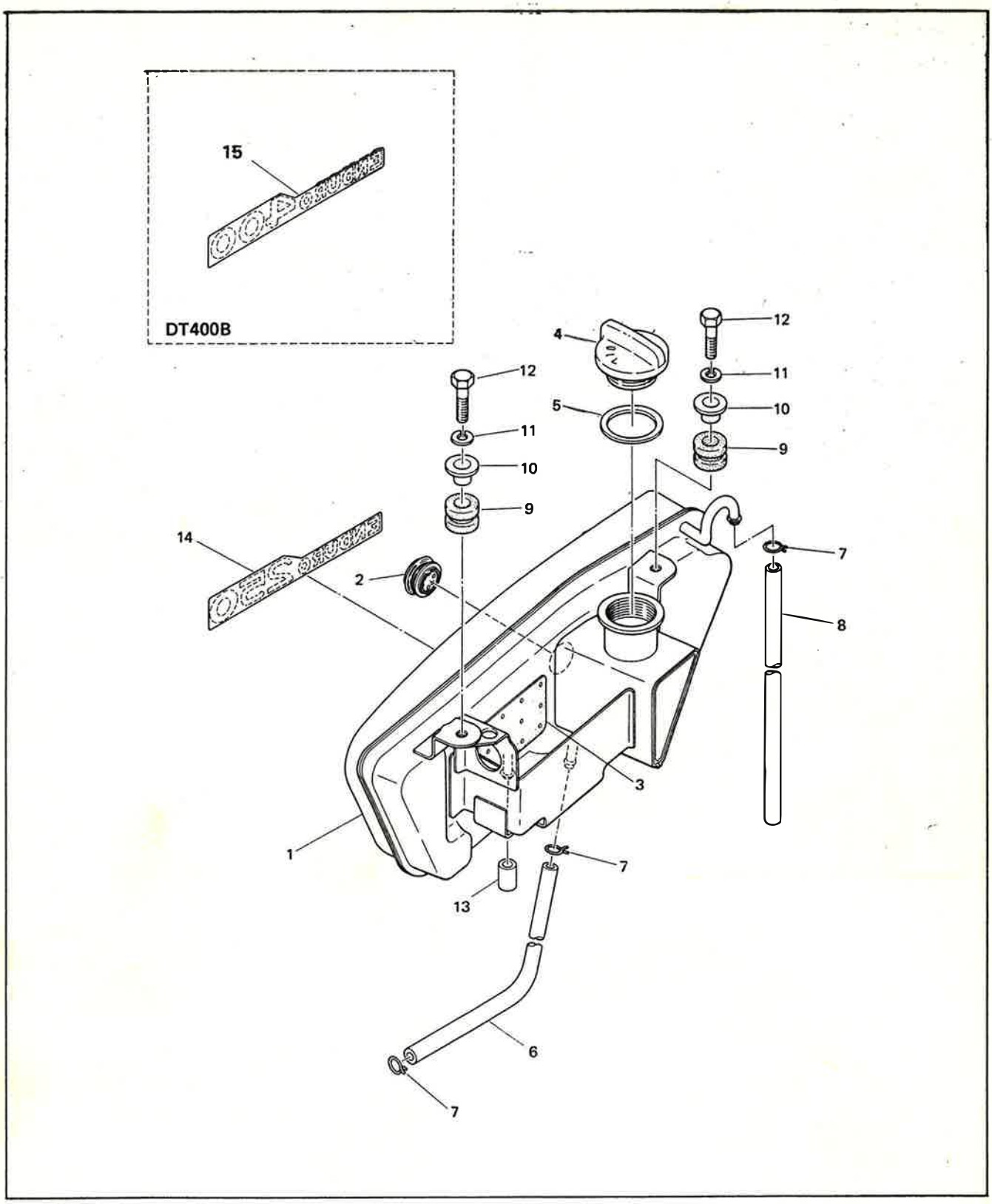
A. Fuel tank



1. Fuel tank complete
2. Fuel tank left graphic 1
3. Fuel tank left graphic 2
4. Fuel tank left graphic 3
5. Cap assembly
6. Cap packing
7. Locating damper 1
8. Locating damper
9. Grommet
10. Washer
11. Spring washer
12. Nut
13. Fuel petcock
14. Petcock packing
15. O-ring
16. Petcock lever
17. Wave washer
18. Lever fitting plate
19. Pan head screw
20. O-ring
21. Filter cup
22. O-ring
23. Screw
24. Plate washer
25. Hose
26. Clip

Fig. 5-10-1

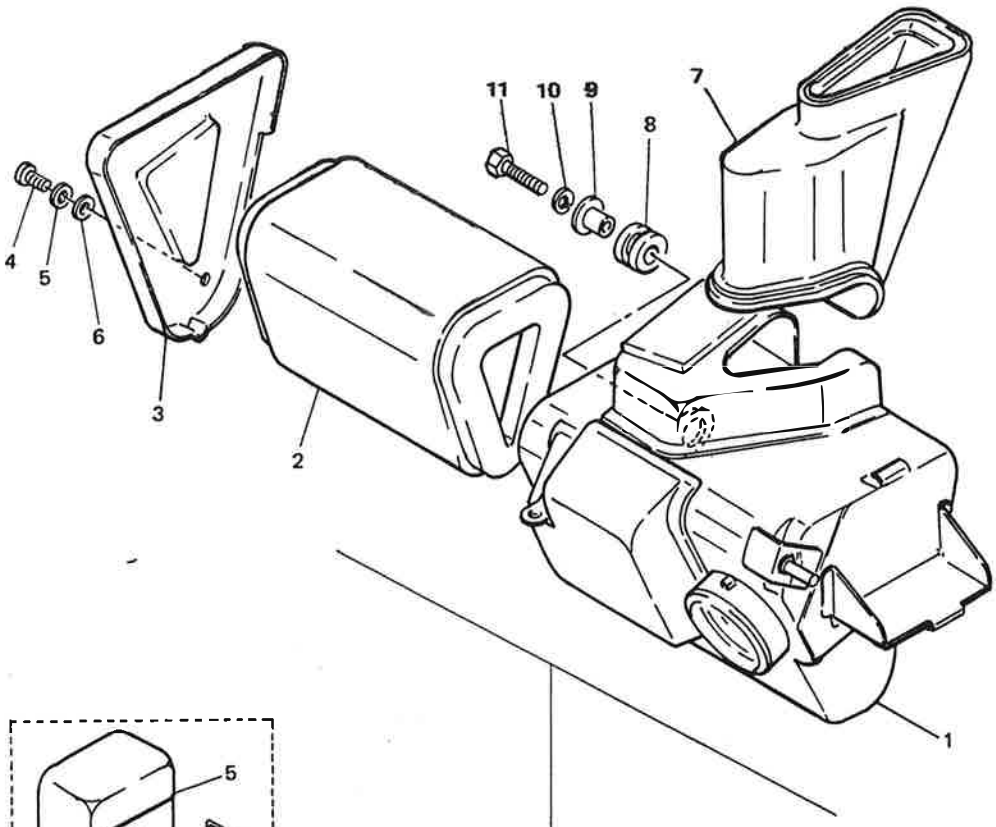
8. Oil tank



1. Oil tank assembly
2. Level gauge
3. Seat
4. Oil tank cap
5. Gasket
6. Hose
7. Clip
8. Hose
9. Grommet
10. Collar
11. Spring washer
12. Bolt
13. Oil tank damper
14. Enduro 250 emblem
15. Enduro 400 emblem

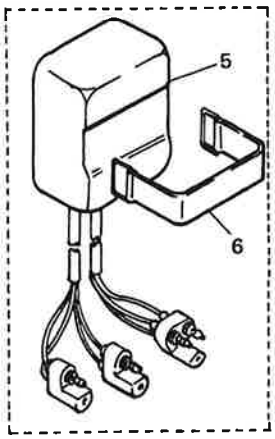
Fig. 5-10-2

C. Air cleaner, tool box, battery box



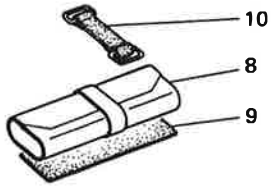
(Air cleaner)

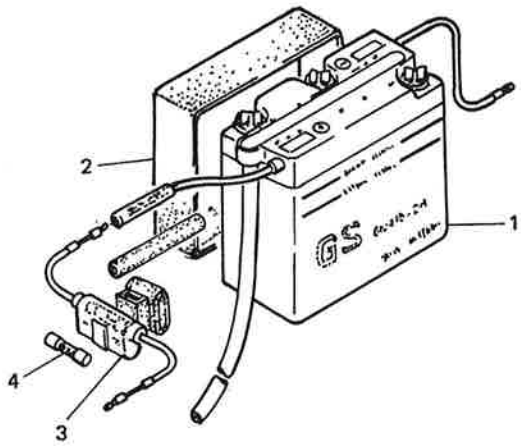
1. Air cleaner case
2. Air cleaner element
3. Case cap
4. Pan head screw
5. Spring washer
6. Washer
7. Duct
8. Battery box, damper 1
9. Fender collar
10. Spring washer
11. Bolt

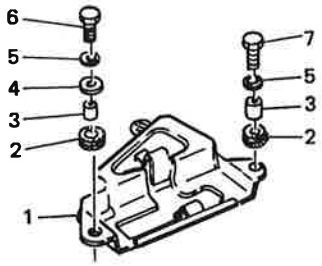


(Battery box)

1. Battery assembly
2. Battery band
3. Fuse holder assembly
4. Fuse (6V.-10A.)
5. C.D.I. unit assembly
6. Unit fitting band



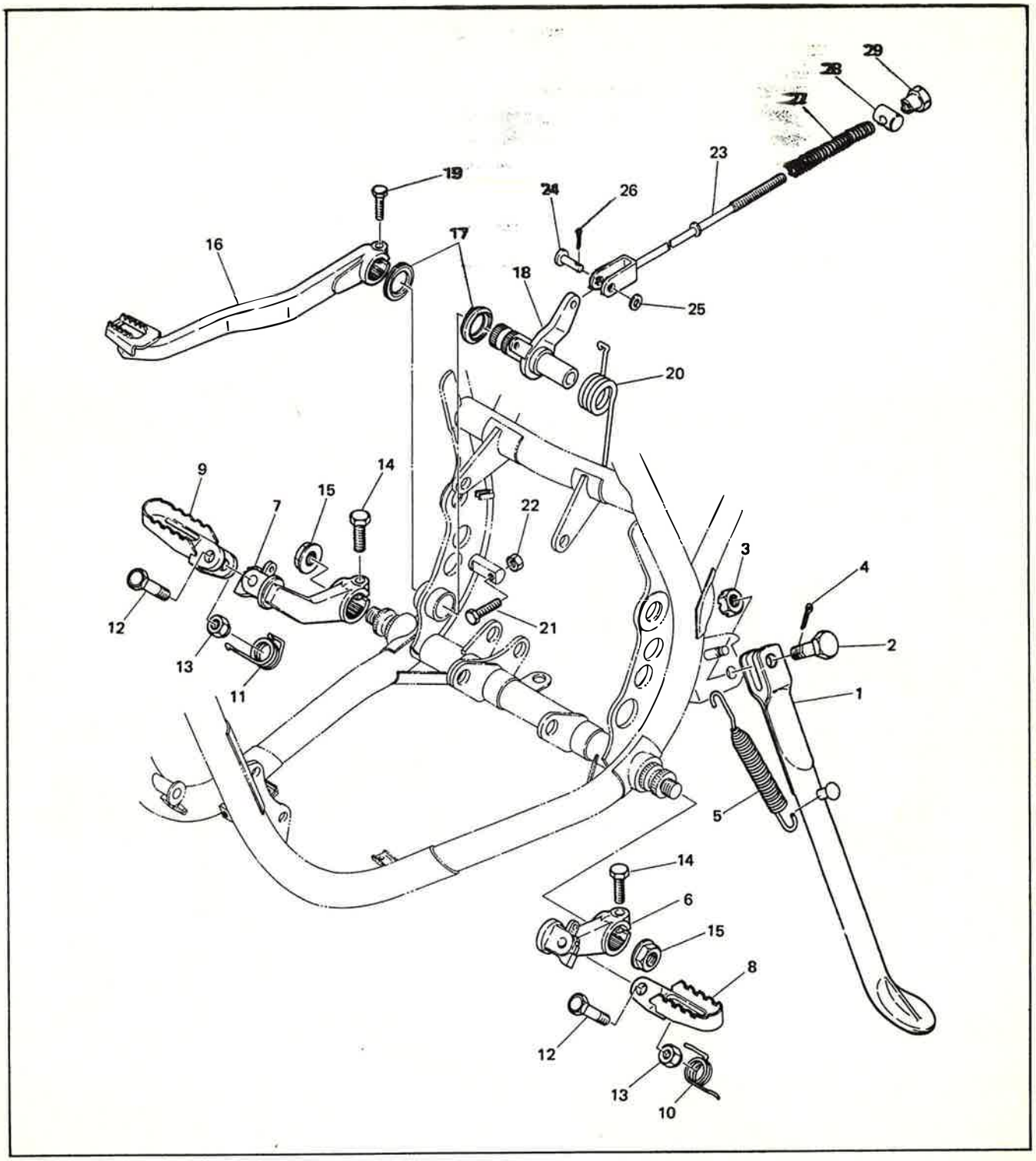




(Tool box)

1. Tool box comp.
2. Battery box damper 1
3. Fender collar
4. Leg shield washer (6.5-20-1.6)
5. Spring washer
6. Bolt
7. Bolt
8. Tool assembly
9. Tool damper
10. Tool band

Fig. 5-10-3



1. Side stand
2. Pin hole hexagon bolt
3. Slotted nut
4. Cotter pin
5. Tension spring
6. Footrest left bracket
7. Footrest right bracket
8. Left footrest
9. Right footrest
10. Return spring left
11. Return spring right
12. Bolt
13. Self locking nut
14. Bolt
15. Nut
16. Brake pedal
17. Dust cover
18. Brake shaft
19. Bolt
20. Torsion spring
21. Bolt
22. Nut
23. Brake rod
24. Pin
25. Plain washer
26. Cotter pin
27. Compression spring
28. Pin
29. Nut

Fig. 5-10-4

5-11. Frame dimensions

Unit: mm

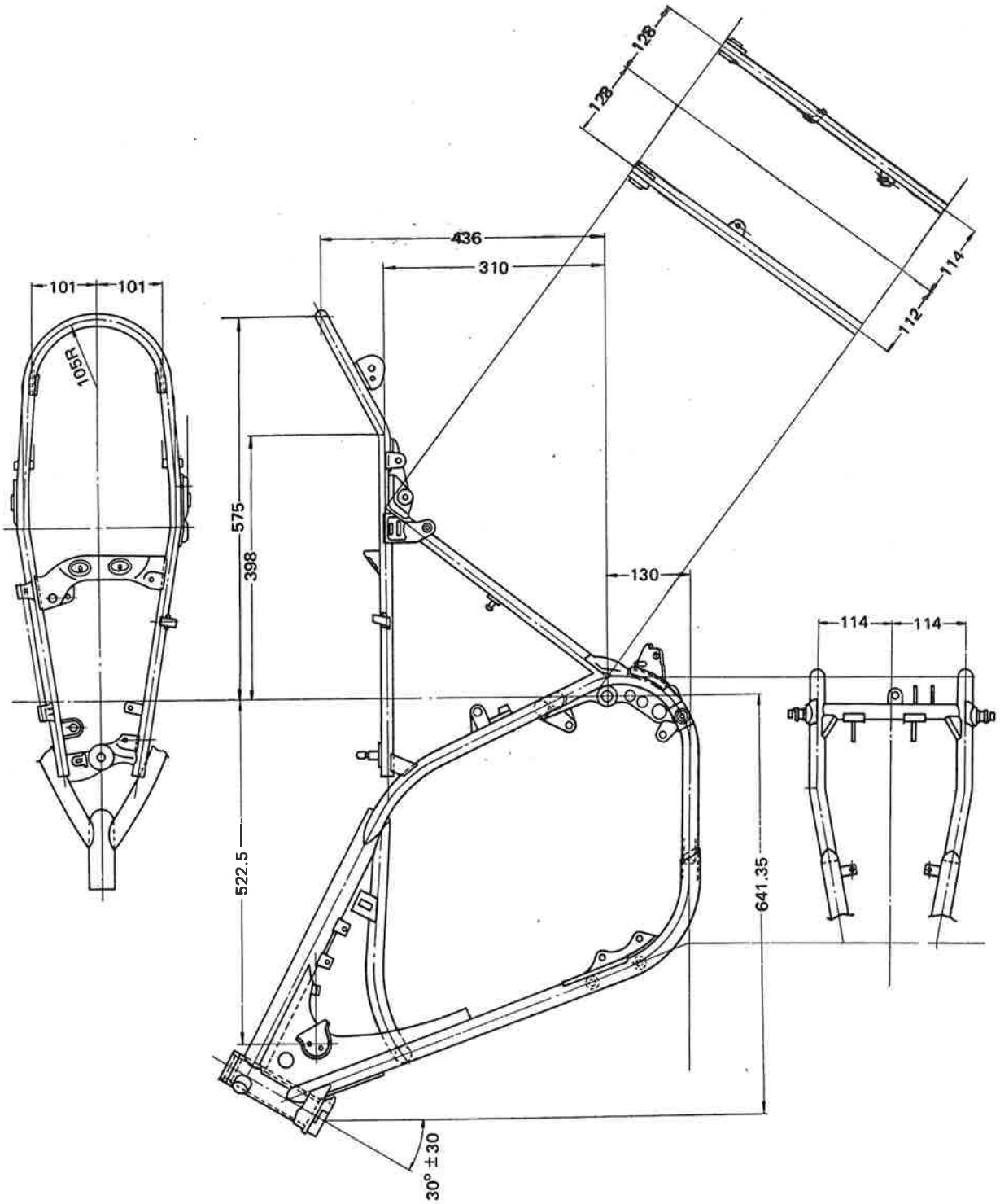


Fig. 5-11-1

CHAPTER 6. ELECTRICAL

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6

6

6-1. Description

The DT250B/400B series electrical systems are lightweight and functional for dependable engine operation and all necessary lighting equipment. A 6 volt battery is used in conjunction with the flywheel magneto. All of the light bulbs have been increased in output to insure sufficient night riding visibility.
The DT250B utilizes a Flywheel Magneto Ignition system. The DT400B utilizes Capacitor Discharge Ignition system. However, both models utilize a charging coil which is excited by the magnetic flux of a rotating flywheel magneto.
Therefore, this chapter contain a section for DT250B ignition, another section for DT400B ignition and then common section for charging, battery and lighting.

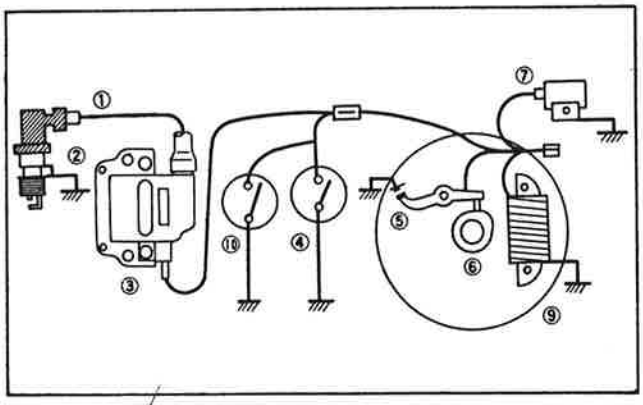
A. Electrical components

Part Name	DT250B		DT400B	
	Manufacturer	Type	Manufacturer	Type
Spark Plug	N.G.K.	B-8ES	N.G.K.	B-9ES
Ignition Coil	Mitsubishi	F6T-401	Mitsubishi	F6T-401
Rectifier	Stanley	DE2304	Stanley	DE2304
Fuse	—	10 A. x 2 PCS.	—	10 A. x 2 PCS.
Battery	GS or FB	6N4B-2A or 6N4B-2A-3	GS or FB	6N4B-2A or 6N4B-2A-3
Rear Stop Switch	Asahi Denso	YST37S-001	Asahi Denso	YST37S-001
Headlight	—	6 V. 35 W/35 W.	—	6 V.35 W/35 W.
High Beam Ind. Bulb	—	6 V. 3W.	—	6 V. 3W.
Tail/Stoplight Bulb	—	6 V. 5.3 W/17 W.	—	6 V. 5.3 W/17 W.
Speedometer Bulb	—	6 V. 3W.	—	6 V. 3W.
Tachometer Bulb	—	6 V. 3 W.	—	6 V. 3 W.
Flasher Bulb(s)	—	6 V. 17 W.	—	6 V. 17 W.
Flasher Pilot Light	—	6 V. 3 W.	—	6 V. 3 W.
Flasher Relay	Nippon Denso	JEK-0070	Nippon Denso	JEK-0070

6-2. Ignition system for DT250B

A. Description of operation

The ignition system consists of the components as shown right. As the flywheel rotates, an electromotive force develops in the ignition source coil, and produces a voltage in the ignition coil primary windings. The ignition coil is a kind of transformer, with a 1:50 turns ratio of the primary to the secondary winding. The voltage (150 ~ 300 V.) which is produced in the primary coil, is stepped up to 12,000 ~ 14,000 V. by mutual-induction and electric spark jumps across the spark plug electrodes.



1. High-tension wire
2. Spark plug
3. Ignition coil
4. Main switch
5. Contact breaker
6. Cam
7. Condenser
8. Ignition power source coil
9. Flywheel magneto
10. Engine stop switch

Fig. 6-2-1

B. Ignition timing

Refer to Chapter 2, Section 5, A and B for ignition timing procedure.

C. Spark gap test

The entire ignition system can be checked for misfire and weak spark using the Electro-Tester. If the ignition system will fire across a sufficient gap, the engire ignition system can be considered good. If not, proceed with individual component tests until the problem is found. (Fig. 6-2-2)

1. Warm-up engine thoroughly so that all electrical components are at operating temperature.
2. Stop engine and connect tester as shown.
3. Start engine and increase spark gap until misfire occurs. (Test at various R.P.M.'s between idle and red line.)

Minimum Spark Gap: 0.20 in. (5 mm.)

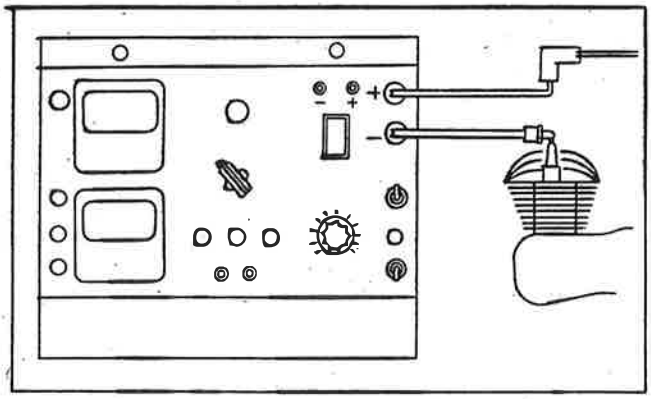


Fig. 6-2-2

D. Ignition coil

1. Coil spark gap test
   a. Remove fuel tank and disconnect ignition coil from wire harness and spark plug.
   b. Connect Electrotester as shown.
   c. Connect fully charged 6 V. Battery to tester.
   d. Turn on spark gap switch and increase gap until misfire occurs.

Minimum Spark Gap: 0.24 in. (6 mm.)

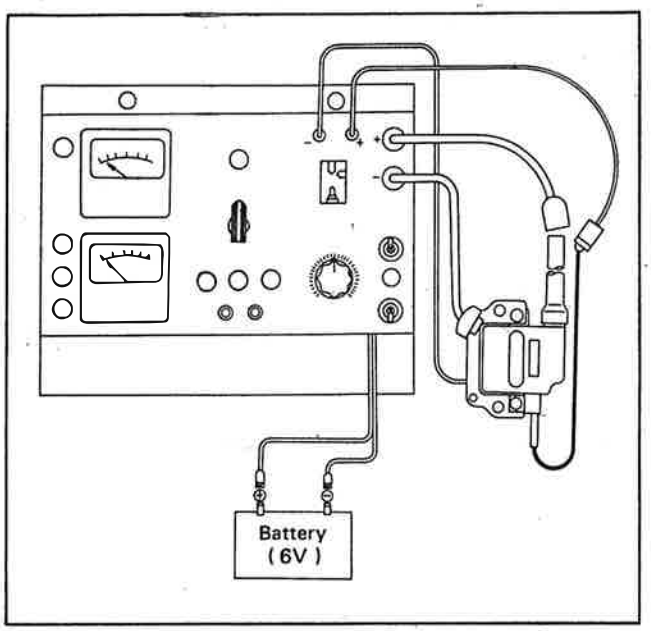


Fig. 6-2-3

E. Condenser test

The condenser is capable of storing a large electrical charge. If it were not for the condenser, an electric arc would jump across the separating contact points, causing them to burn. Burned contact points greatly affect the flow of current in the primary winding of the ignition coil. If the contact points show excessive wear, or the spark is weak but the ignition coil is in good condition, check the condenser.

1. Condenser insulation test (use electro-tester).
   a. Set ohmmeter to highest resistance scale (Ω. x 1,000 or higher).
   b. Remove condenser from engine and connect ohmmeter as shown right.
   c. Resistance reading should be "Infinity" or very close to it.

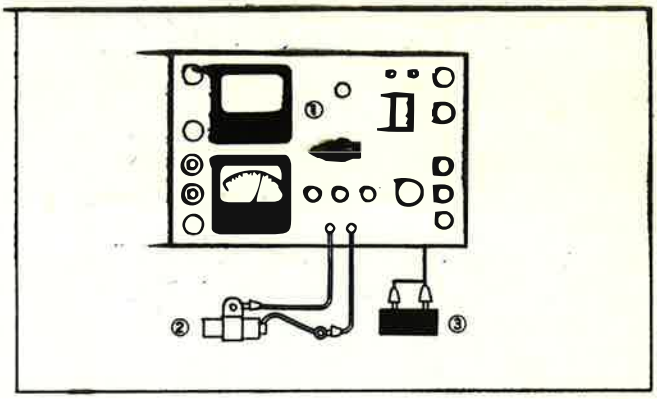
Minimum resistance: 3MΩ.

2. Capacity test (use electro-tester)
   a. Calibrate capacity scale.
   b. Connect tester (same as insulation test).
   c. Meter needle will deflect and return to center as condenser is charged. After needle stops, note reading on μF. scale.

Condenser Cap: 0.30μF.

Caution:

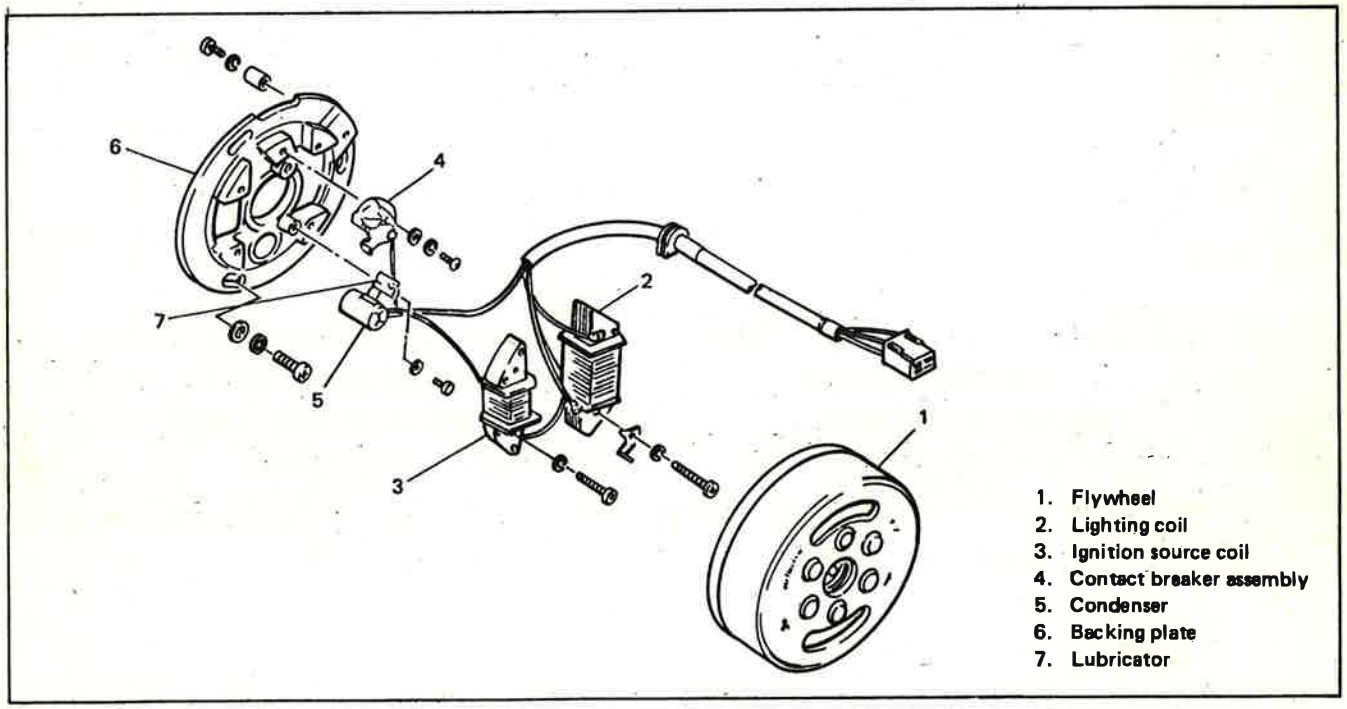
After this measurement, the condenser should be discharged by connecting the positive and negative sides with a thick wire to prevent shock.



1. Capacity range 2. Condenser 3. Battery

Fig. 6-2-4

Flywheel magneto (DT250B)



1. Flywheel
2. Lighting coil
3. Ignition source coil
4. Contact breaker assembly
5. Condenser
6. Backing plate
7. Lubricator

Fig. 6-2-5

6-3. Ignition system for DT400B

A. General information

1. Conventional contact breaker ignition systems.
   For over seventy years the conventional electrical ignition system for gasoline engines has been of the contact breaker type.
   In this system, a set of electrical contacts are opened and closed by mechanical means. The contacts are used to control a large current to the primary winding of an ignition coil. The secondary winding of this coil is connected directly to a spark plug. When the contacts are opened a spark will be generated across the spark plug electrodes to ignite the combustible fuel/air mixture in the engine combustion chamber.
   Because of the millions of cycles (opening and closing) of the contact breaker and the large currents used, the electrical contacts (points) are subject to pitting from electrical arcing. Corrosion from the atmosphere, dirt or grease on the contacts, mechanical misalignment, rubbing-block wear, and mechanical fatigue are additional factors which limit the useful life of the points and require their frequent replacement. Replacement of the contact breaker, adjustment of the breaker gap, and timing of the engine require the skill of a qualified mechanic with special tools. Most contact breaker systems also utilize a mechanical or vacuum spark advance sub-system to vary the spark timing.
   This sub-system is also susceptible to mechanical failure.
2. Capacitor Discharge Ignition (C.D.I.)
   A capacitor discharge ignition (C.D.I.) system eliminates the need for a mechanical contact breaker and its inherent disadvantages. A simple electronic circuit using a large storage capacitor and a Thyristor (Silicon Control Rectifier) provides a correctly-timed, high-intensity voltage to the spark plug.
   The C.D.I. system has many advantages. There is no contact breaker to wear out, become misaligned, or lose its efficiency because of pitted points, increased gap, or contamination. There is no mechanical adjustment required for the contact gap because there are no electrical contacts (points). Only a screwdriver and dial gauge are required to set the timing. There is no mechanical spark advance system to maintain, either. An electronic circuit automatically provides the correct spark advance at all engine speeds.
   Finally, the C.D.I. system provides a stronger, quicker primary current pulse. This improves ignition performance, particularly at higher r.p.m.'s. Additionally, the stronger pulse inhibits misfire due to oil fouling and bridging.

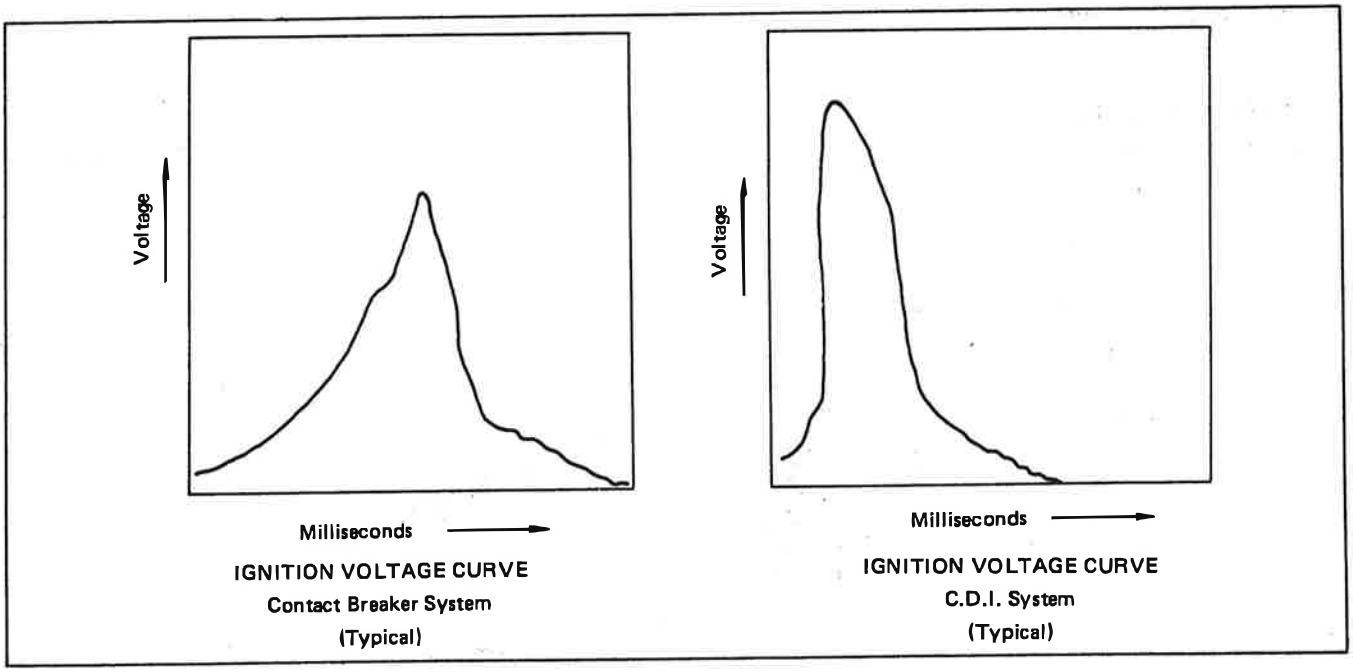


Fig. 6-3-1

Fig. 6-3-2

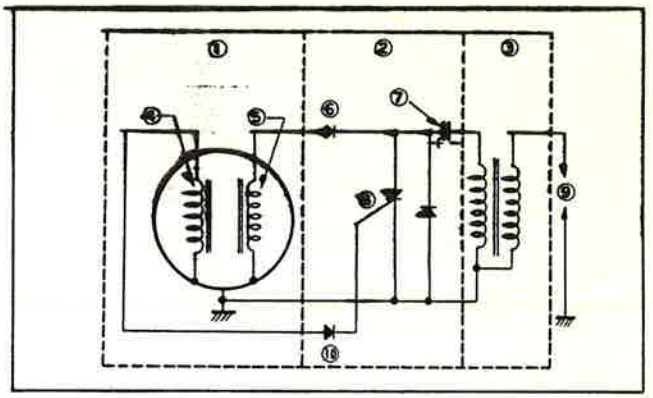
B. [illegible] C.D.I. system

1. The principal parts of the Yamaha C.D.I. system and their primary function(s) are as follows: (See Fig. 6-3-3)
   a. Magneto 1 — The Yamaha C.D.I. magneto is mounted on the crankshaft and incorporates a charging coil for the ignition capacitor and a pulser coil to generate a trigger pulse for ignition timing.
   b. C.D.I. Unit 2 — The "Black box" of the system. This solid state, encapsulated unit contains the electronic control circuitry, including the ignition capacitor (Condenser) silicon controlled rectifier (S.C.R.) (thyristor) charging current rectifiers, and automatic spark advance circuit components.
   c. Ignition Coil 3 — A "Step-up" transformer which increases the voltage from the ignition capacitor to the high voltage used to "fire" the spark plug.

SPECIFICATIONS

Model	DT400B
Magneto-Model	F0T02174
C.D.I. unit-Model	F8T00172
Ignition Coil-Model	F6T401

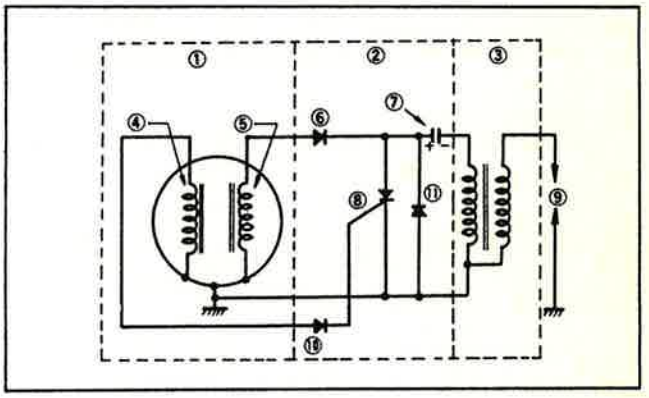
1. Description of operation
   a. As the magneto turns it induces an alternating current (AC) in the charge coil (5). This AC current is rectified to a direct current (DC) by the diode in the C.D.I. unit and charges the Ignition Capacitor (7) to approximately 350 V. (See Figure 6-3-4)
   The Thyristor (Silicon Control Rectifier) (8) prevents the discharge of the ignition capacitor until it receives a positive (+) trigger pulse from the Pulser Coil (4) (See Figure 6-3-5).



C.D.I. Schematic

1. Magneto
2. C.D.I. unit
3. Ignition coil
4. Pulser coil
5. Charging coil
6. Diode
7. Condenser
8. Thyristor
9. Spark plug
10. Diode

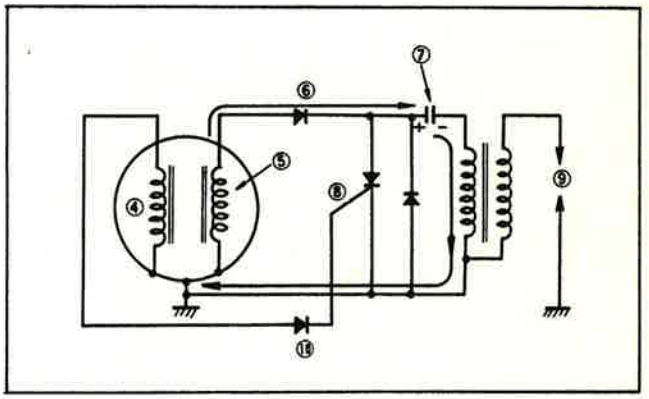
Fig. 6-3-3



C.D.I. Schematic

1. Magneto
2. C.D.I. unit
3. Ignition coil
4. Pulser coil
5. Charging coil
6. Diode
7. Ignition capacitor
8. Thyristor
9. Spark plug
10. Diode
11. Diode

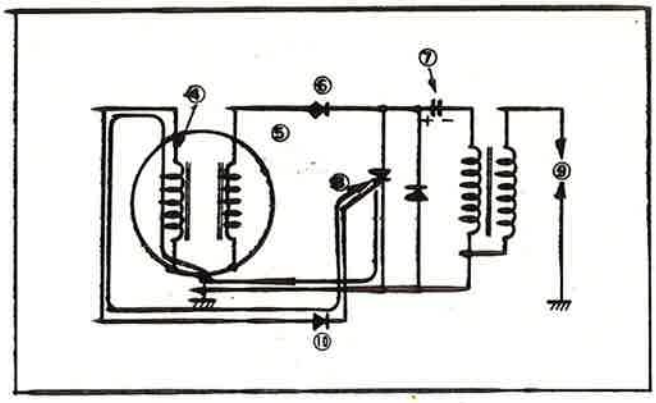
Fig. 6-3-4



Ignition Capacitor Changing

Fig. 6-3-5

b. When the mark on the rotor aligns with the mark on the pulser coil (See Figure 6-3-6), a trigger pulse is sent to the thyristor gate (See Figure 6-3-7). This pulse allows the thyristor (8) to conduct and the current stored in the ignition capacitor (7) will quickly flow through the primary winding of the ignition coil (3) (See Figure 6-3-8).
This induces a high voltage in the ignition coil secondary winding which causes a spark to jump across the electrodes of the spark plug.

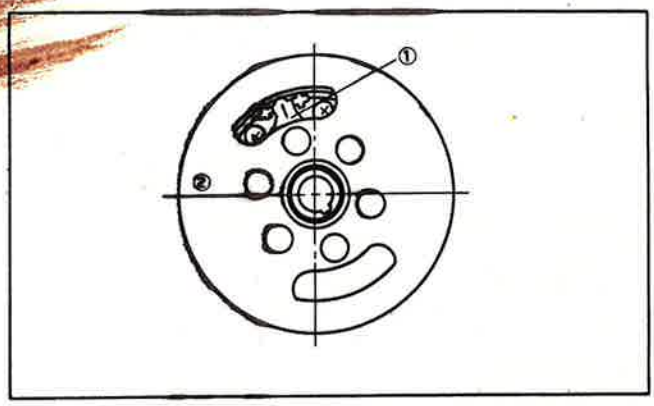


Trigger Pulse to Thyristor

Fig. 6-3-6

c. Automatic Spark Advance System
An electronic circuit in the C.D.I. unit will automatically advance the ignition spark as the engine speed increases. The degree of advance approximately 400 ~ 760 mm.

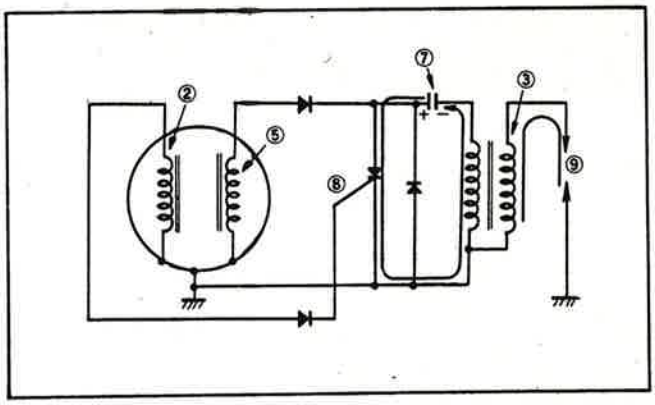
	Retarded	Advanced
Ignition timing	3°	21° (at 3,000 r.p.m.)



Timing Marks Aligned

1. Mark, pulser coil 2. Mark flywheel

Fig. 6-3-7



Ignition Capacitor Discharges and Spark Plug Fires

Fig. 6-3-8

2. Troubleshooting

Caution:

Avoid using an improper tester (insulation resistance testers or other testers with a battery of large capacity). The use of a large capacity tester may ruin the C.D.I. unit.

a. Checking the Magneto Charge Coil and Pulser.

The resistance of the magneto ignition coil windings is as specified below. To locate the cause of trouble (broken coil, short-circuit, etc.), measure the resistance across each lead as shown in chart.

DT400B	
Charge Coil	Brown-Black Approx. 12.5 Ω. ± 10%
Pulser	White/Red-White/Green Approx. 90 Ω. ± 10%

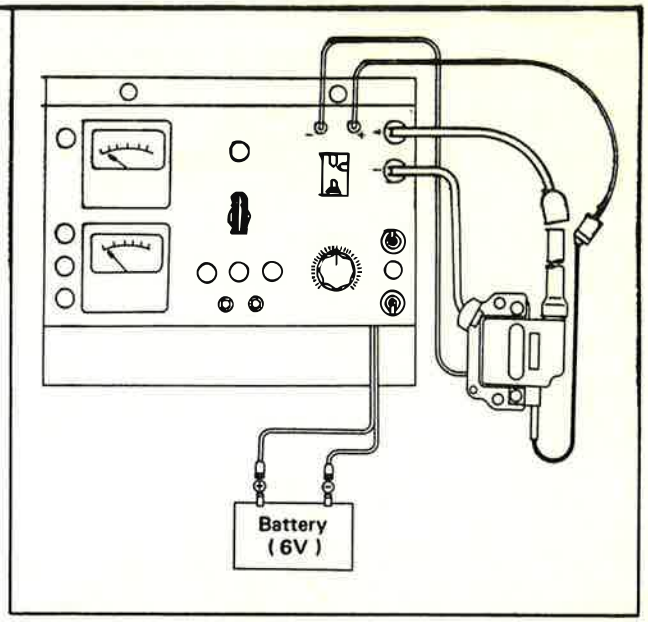


Fig. 6-3-9

b. Ignition coil

1) Coil spark gap test

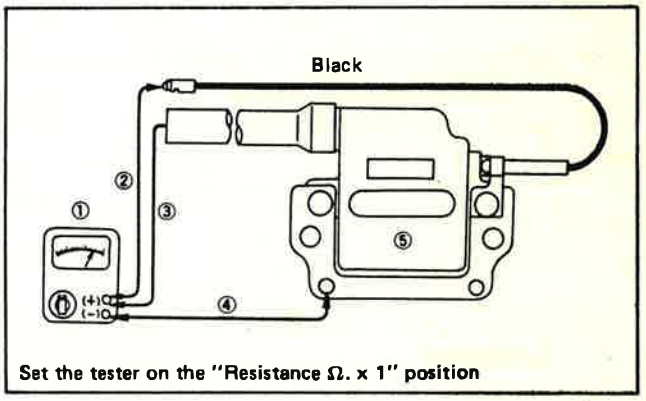
- Remove fuel tank and disconnect ignition coil from wire harness and spark plug.
- Connect electrotester as shown.
- Connect fully charged 6V. battery to tester.
- Turn on spark gap switch and increase gap until misfire occurs.

Minimum Spark Gap: 0.24 in. (6 mm.)

2) Direct Current Resistance Testing

Use a Pocket Tester or equivalent ohmmeter to determine resistance and continuity of primary and secondary coil windings. (Fig. 6-3-10)

	DT250B	Temperature
Primary Coil Resistance (Use (Ω. x 1) Scale)	0.61 Ω. ± 10%	20°C or 68°F
Secondary Coil Resistance (Use (Ω. x 100) Scale)	6.0 KΩ. ± 20%	20°C or 68°F



1. Pocket-tester
2. Primary coil resistance value
3. Secondary coil resistance value
4. Ground
5. Ignition coil

Fig. 6-3-10

3. Inspection C.D.I. unit

For checking the C.D.I. unit on DT400B use the Yamaha C.D.I. tester and its instruction manual.

4. Wiring connectins

a. The wiring between the magneto, C.D.I. unit, and ignition coil uses couplers to prevent any wrong connection. When connecting the ground circuit and the ignition coil, particular care should be taken. If these are connected wrong, the C.D.I. unit will become inoperative.

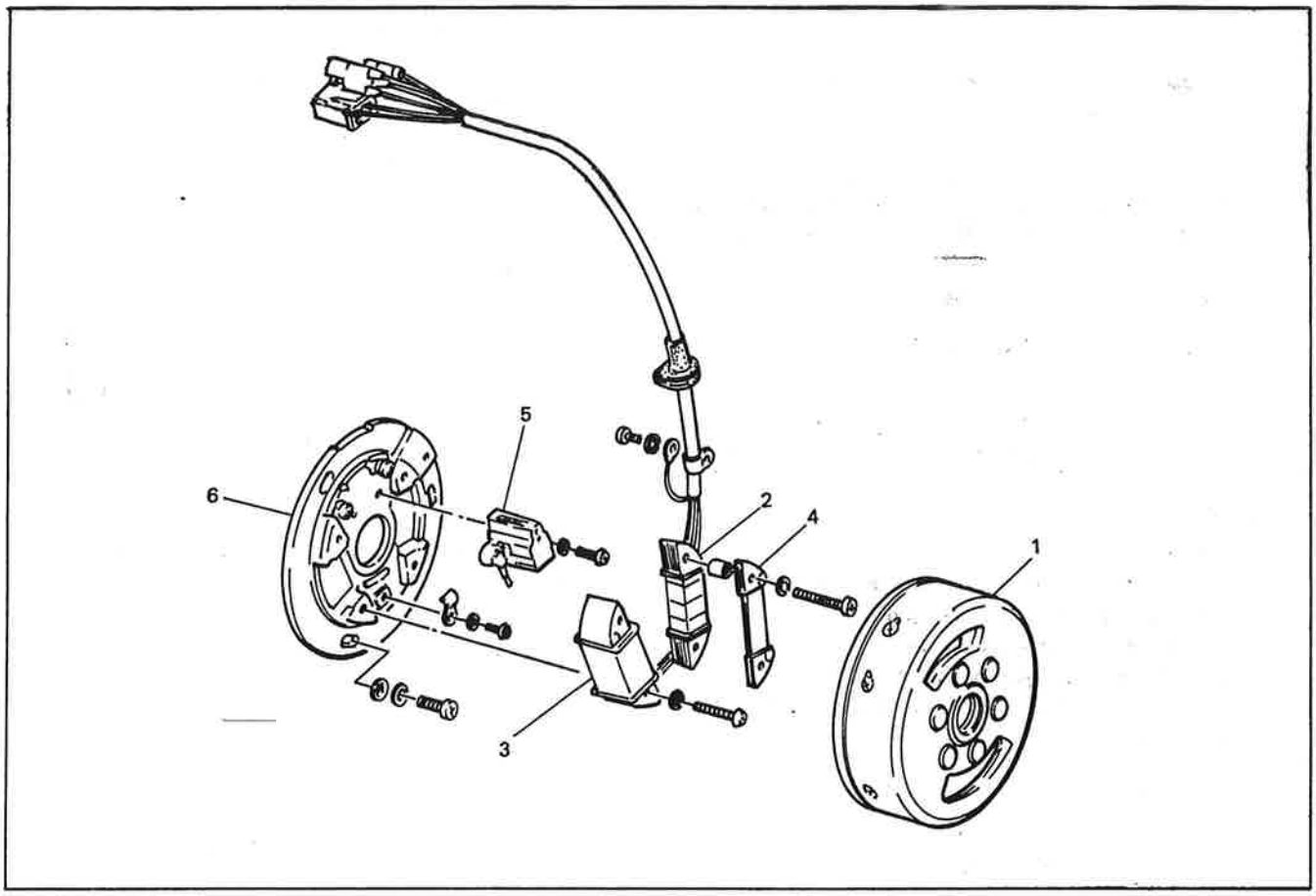
b. Wiring Notes

1) Connection must be done accurately.
Special care is required for connection of the ground circuit and ignition coil.

2) The C.D.I. unit and ignition coil should be installed in the specified positions. If position is to be changed, a dry and airy place should be selected. Keep free from mud and water.

3) To remove the rotor, be sure to use the rotor puller (an accessary tool). Avoid using a hammer, or the rotor may be damaged.

4) Handle the C.D.I. unit with special care. If you should drop it, the incorporated electronic components will be damaged.



1. Flywheel assembly
2. C.D.I. charge coil
3. Lighting coil (1)
4. Lighting coil (2)
5. C.D.I. pulser coil
6. Backing plate

Fig. 6-3-11

6-4. Spark plug

The life of a spark plug and its discoloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with suitable ones determined by the color and condition of the bad plugs.
One machine may be ridden only in urban areas at low speeds, whereas another may be ridden for hours at high speeds, so confirm what the present plugs indicate by asking the rider how long and how fast he rides, and recommend a hot, standard or cold plug type accordingly.
It is actually economical to install new plugs often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

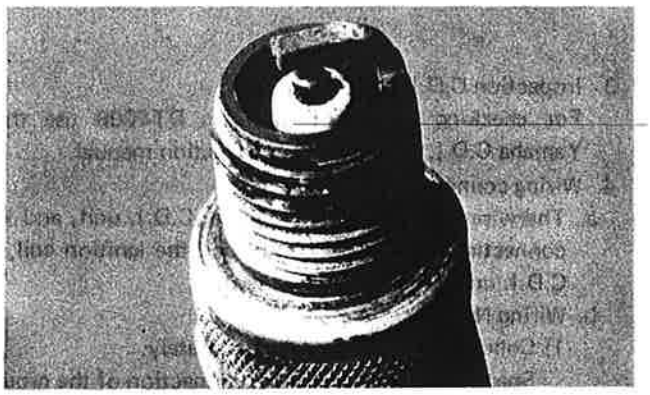


Fig. 6-4-1

A. How to "read" spark plug (condition)

1. Best . . . . . When the porcelain around the center electrode is a light tan color. (Fig. 6-4-1)

2. If the electrodes and porcelain are black and somewhat oily, replace the plug with a hotter-type for low speed riding. (Fig. 6-4-2)

Fig. 6-4-2

3. If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder-type for high speed riding. (Fig. 6-4-3)

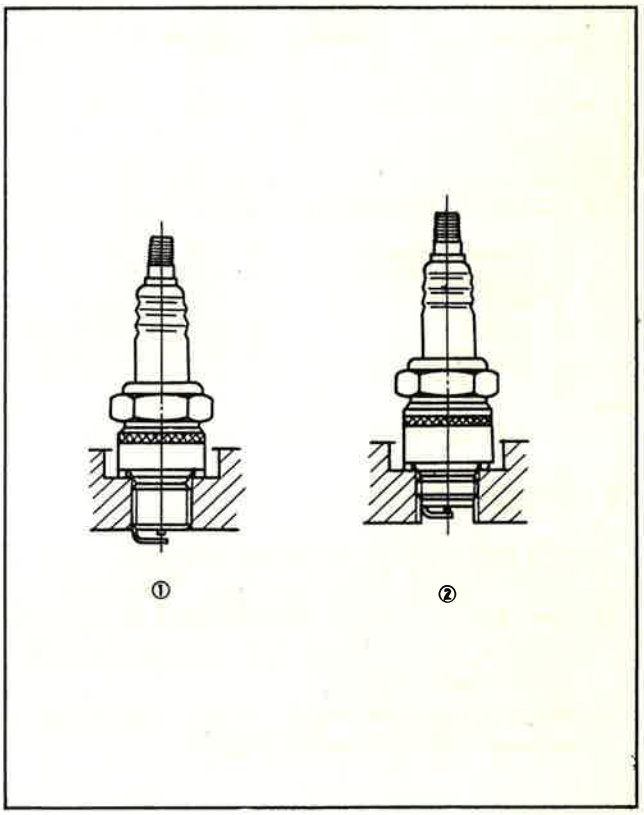
Fig. 6-4-3

B. Inspection

Instruct the rider to:

1. Inspect and clean the spark plug at least once per month or every 500 ~ 1,000 kms.
2. Clean the electrodes of carbon and adjust the electrode gap.
3. Be sure to use the proper reach plug as replacement to avoid overheating, fouling or piston damage.

	Model	
	DT250B	DT400B
Spark Plug Type	B-8ES	B-9ES
Spark Plug Gap	0.020 ~ 0.024 in. (0.5 ~ 0.6 mm.)	0.020 ~ 0.024 in. (0.5 ~ 0.6 mm.)



1. Proper reach
2. Insufficient reach

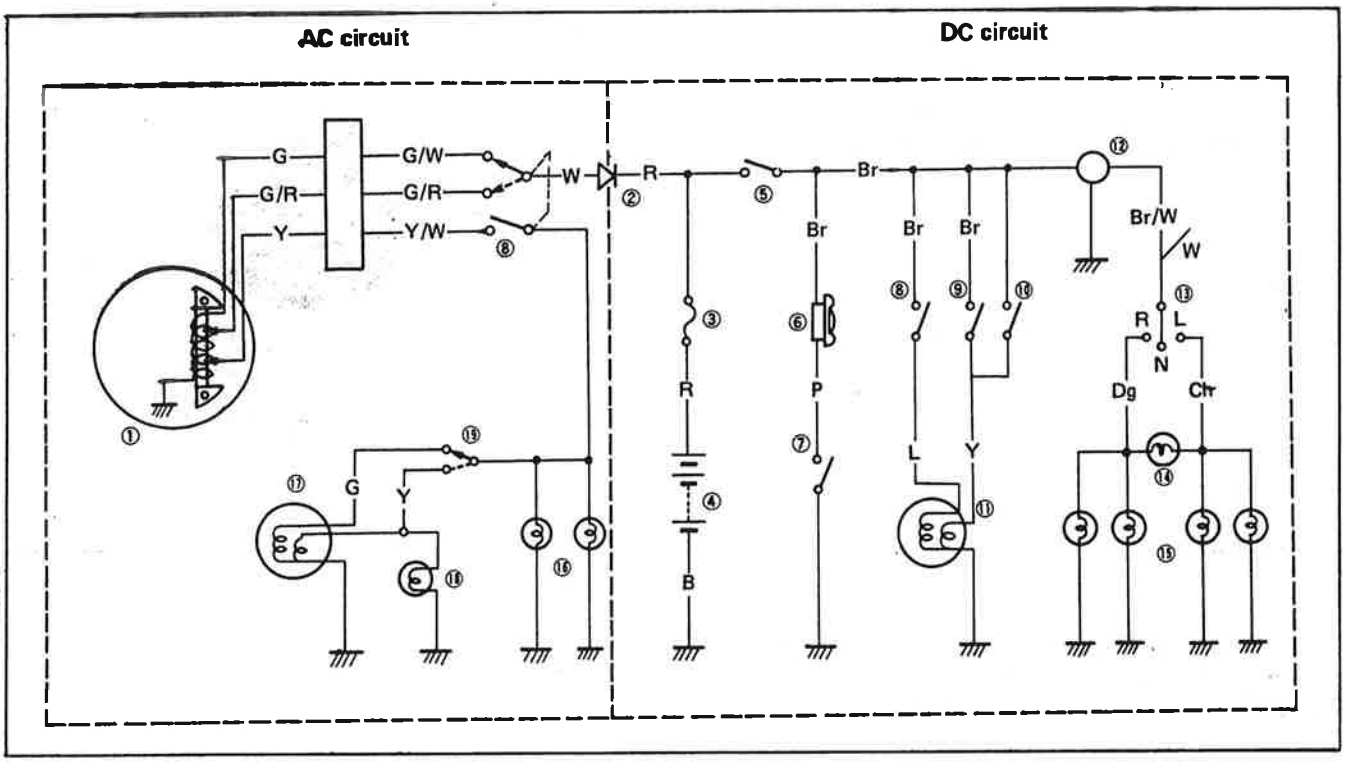
Fig. 6-4-4

6-5. Charging system

A. Description

The charging system consists of the flywheel, the charging/lighting coil, rectifier and battery. Alternating current from the charging/lighting coil flows to the headlight, meter lights, high beam indicator and, also, to the rectifier where it is converted to direct current for charging the battery. So long as all electrical load items are installed and working properly, the system does not require a regulator. This is due to the fact that as engine r.p.m. increases, frequency increases, lighting/charging coil impedance (resistance) increases. This impedance increase acts to control the output of the magneto.

Charging circuit



1. Flywheel magneto
2. Silicon rectifier
3. Fuse
4. Battery
5. Main switch
6. Horn
7. Horn switch
8. Headlight switch
9. Stoplight switch (front)
10. Stoplight switch (left)
11. Tail/stoplight
12. Flasher relay
13. Flasher switch
14. Flasher indicator
15. Flasher lights
16. Meter lamp
17. Headlight
18. High beam indication
19. Dimmer switch

Fig. 6-5-1

B. Charging output test

1. Raise seat and locate battery connections.
2. Connect "Electro Tester" as shown. (Fig. 6-5-2)
3. Turn ignition switch to ON (daytime) position, start engine and note voltage and amperage readings at r.p.m.'s specified below.
4. Switch to nighttime (lights on) and note voltage and amperage readings at specified r.p.m.'s.

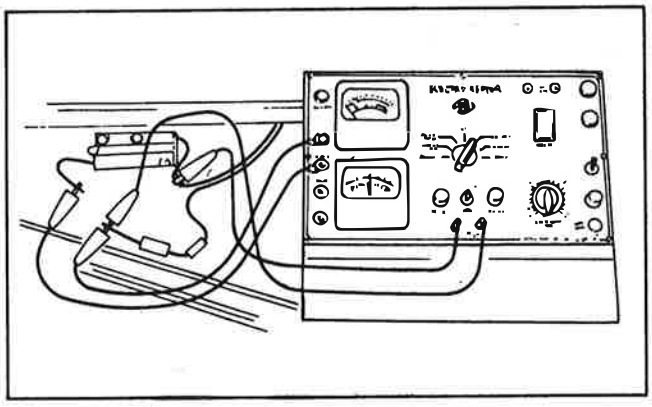


Fig. 6-5-2

R.P.M.	Voltage	
	Daytime	Nighttime
2,000 r.p.m.	8.5 V. (DT250B) 7.0 V. (DT400B)	7.0 V. (DT250B) 7.0 V. (DT400B)
8,000 r.p.m.	8.5 V. (DT250B/DT400B)	8.0 V. (DT250B/DT400B)

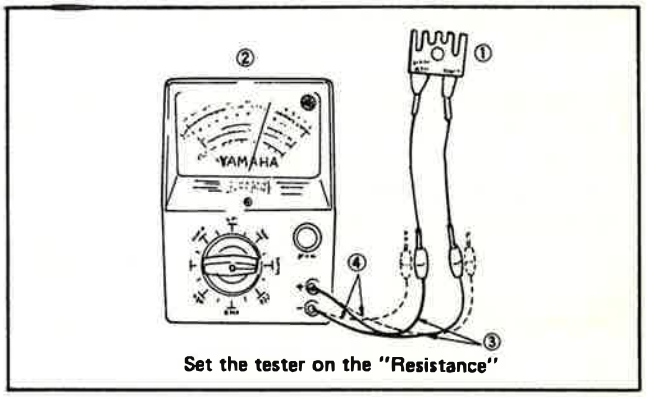
R.P.M.	Amperage	
	Daytime	Nighttime
2,000 r.p.m.	1.8 ± 0.5 A. (DT250B/DT400B)	0.7 ± 0.3 A. (DT250B/DT400B)
8,000 r.p.m.	2.7 ± 0.5 A. (DT250B) 3.0 ± 0.5 A. (DT400B)	1.5 ± 0.3 A. (DT250B) 1.3 ± 0.5 A. (DT400B)

C. Checking silicon rectifier

1. Checking with normal connection using Yamaha Pocket Tester:
   Connect the tester's red lead (+) to the silicon rectifier's red lead, and connect the tester's black lead (−) to the rectifier's white lead. (Fig. 6-5-3)
2. Checking with reversed connection using Yamaha Pocket Tester:
   Reverse the tester leads. (Fig. 6-5-3)

Caution:

The silicon rectifier can be damaged, if subject to overcharging. Special care should be taken to avoid a short circuit and/or incorrect connection of the positive and negative leads at the battery. Never connect the rectifier directly to the battery to make a continuity check.



1. Silicon rectifier
2. Electro-tester
3. Checking with normal connection
4. Checking with reversed connection

Fig. 6-5-3

Result

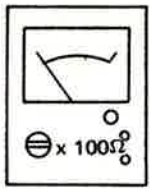
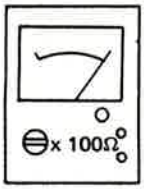
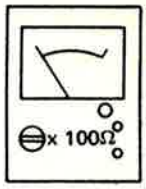
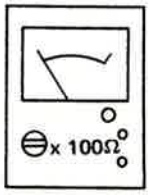
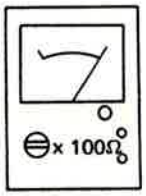
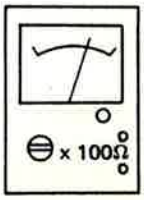
	Good	Replace	Replace
Normal connection			
Reversed connection			

Fig. 6-5-4

Note:

This rectifier test must be checked both normal and reversed connections.

6-6. Battery

The battery is a 6 V., 4 AH. unit that is the power source for the horn, stoplight, neutral light, flasher lights and taillight. Due to the fluctuating charging rate at low engine speeds, the battery will lose its charge if the horn, flashers, and stoplight are used excessively at low engine speeds.
Battery charging begins at about 2,500 r.p.m. Therefore, it is recommended to sustain engine r.p.m.'s at, or over 3,000 to maintain a proper battery charge. Additionally, if the above components are used excessively, battery water level should be checked more frequently than normal as continuous charging will dissipate the water.

A. Checking

1. If sulfation (white accumulations) occurs on plates due to lack of battery electrolyte, the battery should be replaced.
2. If the bottom of the cells are filled with corrosive material falling off plates, the battery should be replaced.
3. If the battery shows the following defects, it should be replaced.
   a. The voltage will not rise to a specific value even after long hours charging.
   b. No gassing occurs in any cell.
   c. The 6 V. battery requires a charging voltage of more than 8.4 V. in order to supply a current of 1 A. for 10 hours.

B. Service life

The service life of a battery is usually 2 to 3 years, but lack of care as described below will shorten the life of the battery.
1. Negligence in keeping battery topped off with distilled water.
2. Battery being left discharged.
3. Over-charging by rushing change.
4. Freezing.
5. Filling with water or sulfuric acid containing impurities.
6. Improper charging voltage/current on new battery.

BATTERY	6 V. 4AH.
ELECTROLYTE	Specific Gravity: 1.26 Quantity: 160 c.c.
INITIAL CHARGING CURRENT	0.4 Amperes/25 hours (New Battery)
RE-CHARGING CURRENT	0.4 Amperes/10 hours (or until Specific Gravity reaches 1.26)
RE-FILL FLUID	Distilled water to Maximum Level Line
RE-FILL PERIOD	Check once per month or more often as required

C. Storage

If the motorcycle is not used for a long time, remove the battery and have it stored by a battery service shop. The following instructions should be observed by shops equipped with charger.
1. Recharge the battery.
2. Store the battery in a cool, dry place, and avoid temperatures below 0°C. (32°F).
3. Recharge the battery before re-installation.

6-7. Lighting and signal systems

A. Description

The lighting system consists of the lighting coil, horn, headlight, taillight, stoplight, flasher lights, meter lamps and the battery. The battery supplies power to the horn, stoplight, neutral light, taillight and flasher lights. Lighting coils in the flywheel magneto supply alternating current (A.C.) for the headlight, meter lights, and for charging the battery through a silicon rectifier diode.

Warning:

Use bulbs of the correct capacity for the headlight, meter lamp and high-beam indicator which are directly connected to the flywheel magneto. If large capacity bulbs are used, the voltage will drop, giving a poor light. On the contrary, if smaller capacity bulbs are used, the voltage will rise, shortening the life of bulbs. When the headlight beam switch is operated to change the beam from one to another, the headlight is designed to keep both bulbs burning during the change-over. This is to protect other light bulbs, meter lamps, etc., from burning out as a result of turning off the headlight, even temporarily. If one of these light bulbs is burnt out while the machine is running, it will overload other bulbs and shorten their service life. Reduce engine speed and replace a burnt bulb as quickly as possible.

B. Lighting tests and checks — A.C. circuit

1. A.C. Circuit Output Test
   With all A.C. lights in operation the circuit will be balanced and the voltage will be the same at all points at a given r.p.m.
   a. Switch Pocket Tester to "AC20V" position.
   b. Connect positive (+) test lead to yellow connection and negative (—) test lead to a good ground. (Fig. 6-7-1)
   c. Start engine, turn on lights and check voltage at each engine speed in table below.

   If measured voltage is too high or too low, check for bad connections, damaged wires, burned out bulbs or bulb capacities are too large throughout the A.C. lighting circuit.

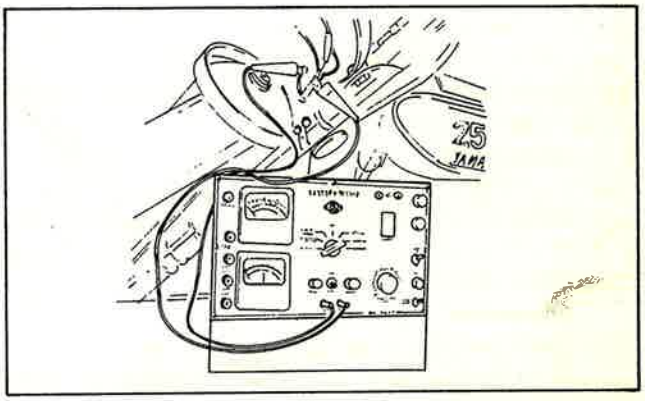


Fig. 6-7-1

Engine R.P.M	Voltage
2,500 r.p.m.	5.5 V.A.C. or More
8,000 r.p.m.	8.0 V.A.C. or More

Note:

This voltage test can be made at any point throughout the A.C. lighting circuit and the readings should be the same as specified above.

2. Lighting Coil Resistance Check
   If voltage is incorrect in A.C. lighting circuit, check the resistance of the yellow wire windings of the lighting coil.
   a. Switch Pocket Tester to "Ω. x 1" position and zero meter.
   b. Connect positive (+) test lead to yellow green and green-red wire from magneto and negative (—) test lead to a good ground on engine. Read the resistance on ohms scale. (Fig. 6-7-2)

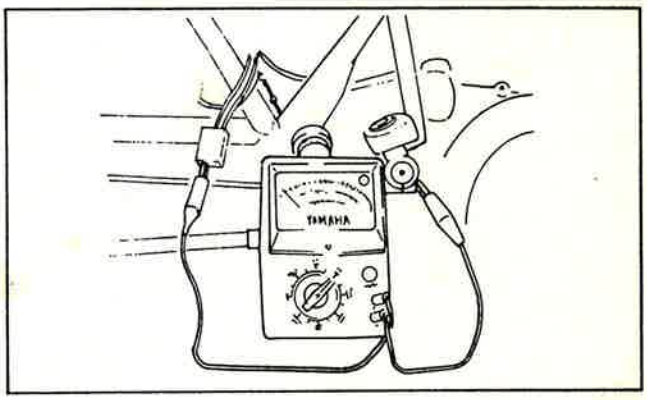


Fig. 6-7-2

Lighting Coil Resistance	0.25 Ω. ± 10% at 20°C or 68°F (DT250B) 0.23 Ω. ± 10% at 20°C or 68°F (DT400B)	Ground to Yellow Leads
Lighting Coil Resistance	0.35 Ω. ± 10% at 20°C or 68°F (DT250B) 0.54 Ω. ± 10% at 20°C or 68°F (DT400B)	Ground to Green/Red Leads
Lighting Coil Resistance	2.10 Ω. ± 10% at 20°C or 68°F (DT250B) 1.73 Ω. ± 10% at 20°C or 68°F (DT400B)	Ground to Green Leads

3. If A.C. lighting circuit components check out properly but circuit voltage is still excessive, go to charging circuit checks (Sec. 5-4 and 5-5). The two circuits share a common source coil. If voltage is low in charging circuit due to a defective battery, rectifier or connection, voltage will be too high in lighting circuit.

C. Lighting tests and checks – D.C. circuit

The 6 V. battery provides power for operation of the horn, taillight, stoplight, neutral light and flasher lights. If none of the above operate, always check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery water, or a defective charging system. See Section 5-4 ~ 5-5, Charging System, for checks of battery and charging system.

1. Horn does not work.
   a. Check for +6 V. on brown wire to horn.
   b. Check for good grounding of horn (pink wire) when horn button is pressed.
2. Stoplight does not work.
   a. Replace bulb.
   b. Check for 6 V. on yellow wire to stoplight.
   c. Check for 6 V. on brown wire to each stop switch (front brake and rear brake switches).
   d. Check for ground on black wire to tail/stoplight assembly.
3. Taillight does not work.
   a. Replace bulb.
   b. Check for 6 V. on blue wire.
   c. Check for ground on black wire to tail/stoplight assembly.
4. Flasherlight(s) do not work.
   a. Replace bulb.
   b. Right Circuit.
      1) Check for +6 V. on dark green wire to light.
      2) Check for ground on black wire to light assembly.
   c. Left Circuit
      1) Check for +6 V. on dark brown wire to light.
      2) Check for ground on black wire to light assembly.
   d. Right and Left Circuits do not work.
      1) Check for +6 V. on brown/white wire to flasher switch on left handlebar.
      2) Check for +6 V. on brown wire to flasher relay.
      3) Replace flasher relay.
      4) Replace flasher switch.

D. [illegible]

1. Flasher relay
   The flasher relay is employed 6 V., condenser type. (Fig. 6-7-3).

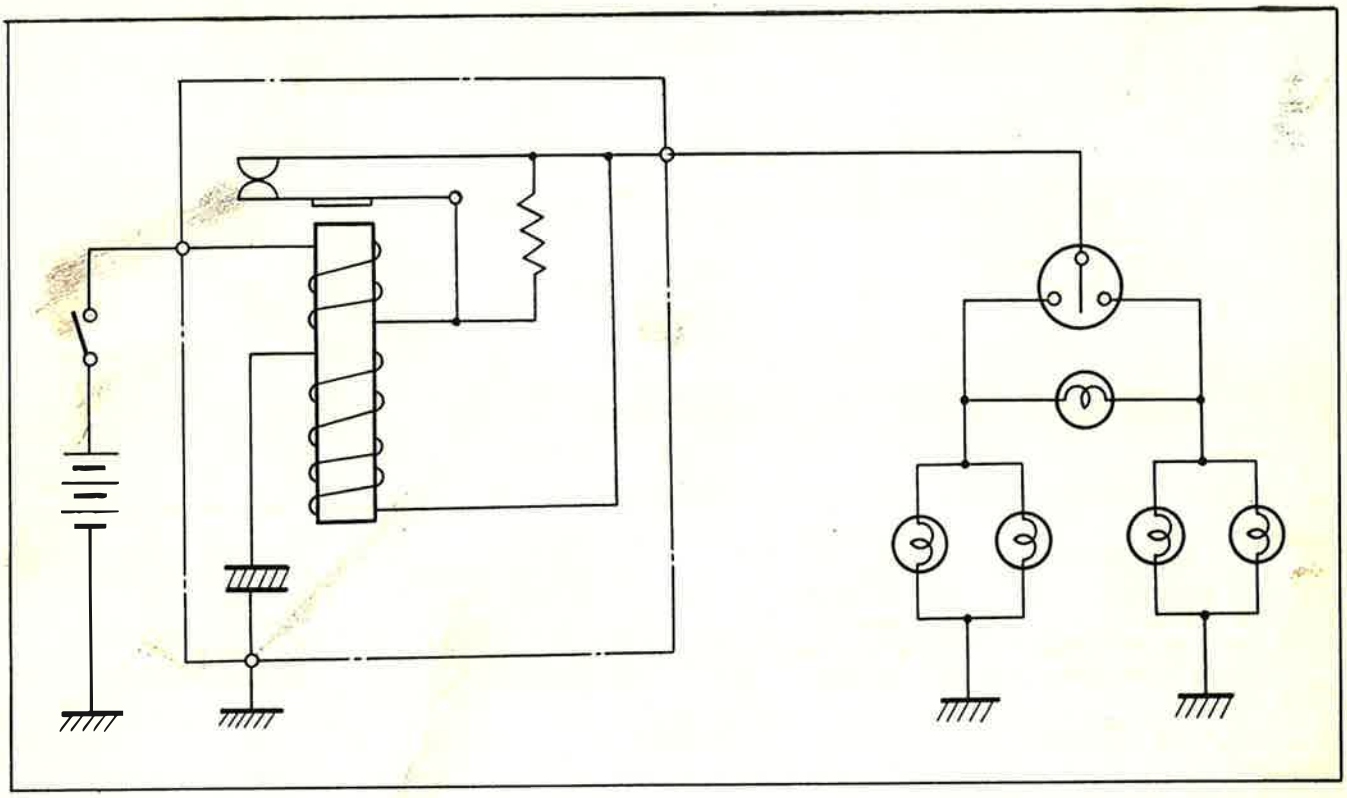
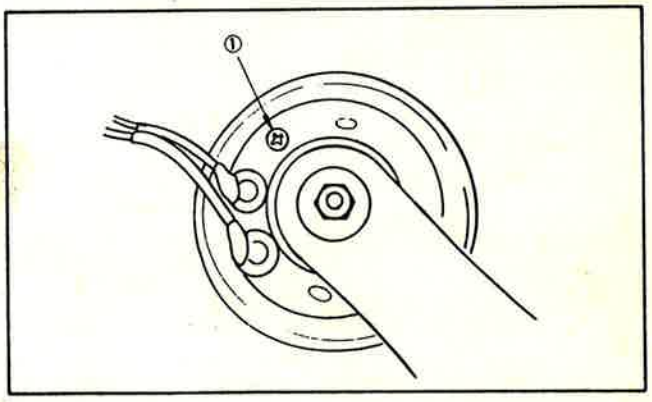


Fig. 6-7-3

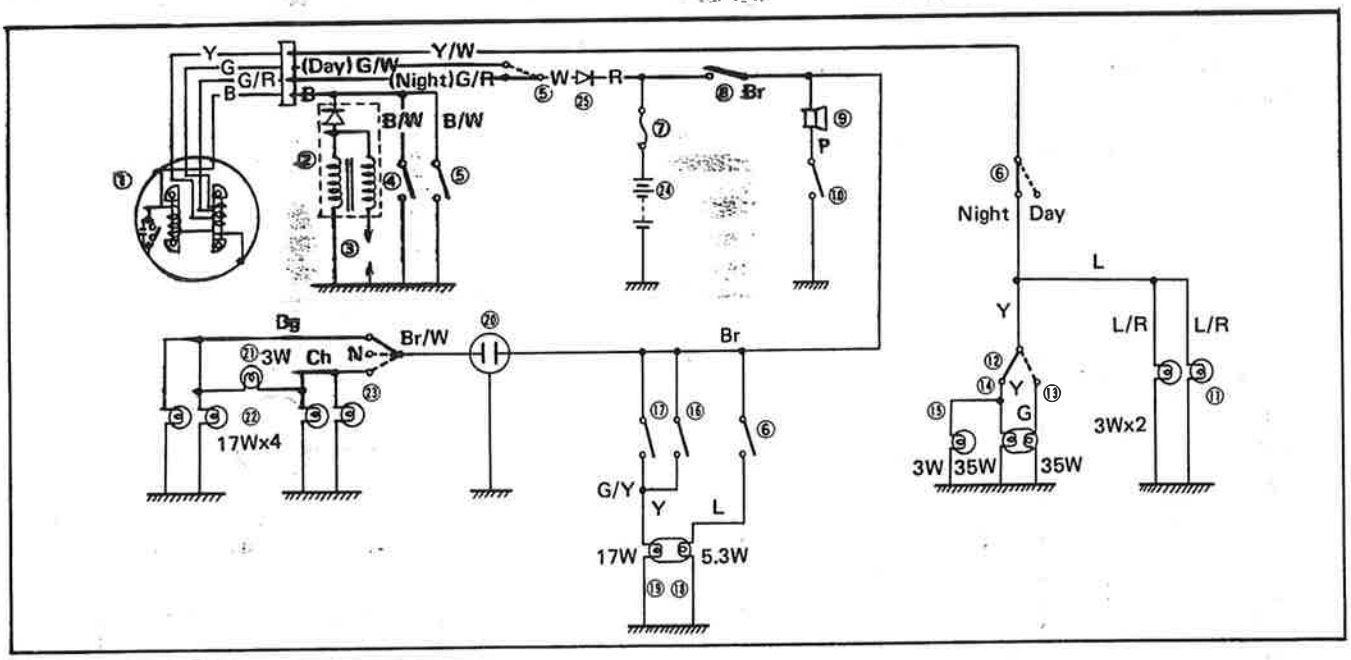
2. Horn
   The horn is a 6 V., flat type, and has a tone volume adjusting screw on its back. (Fig. 6-7-4)



1. Adjusting screw

Fig. 6-7-4

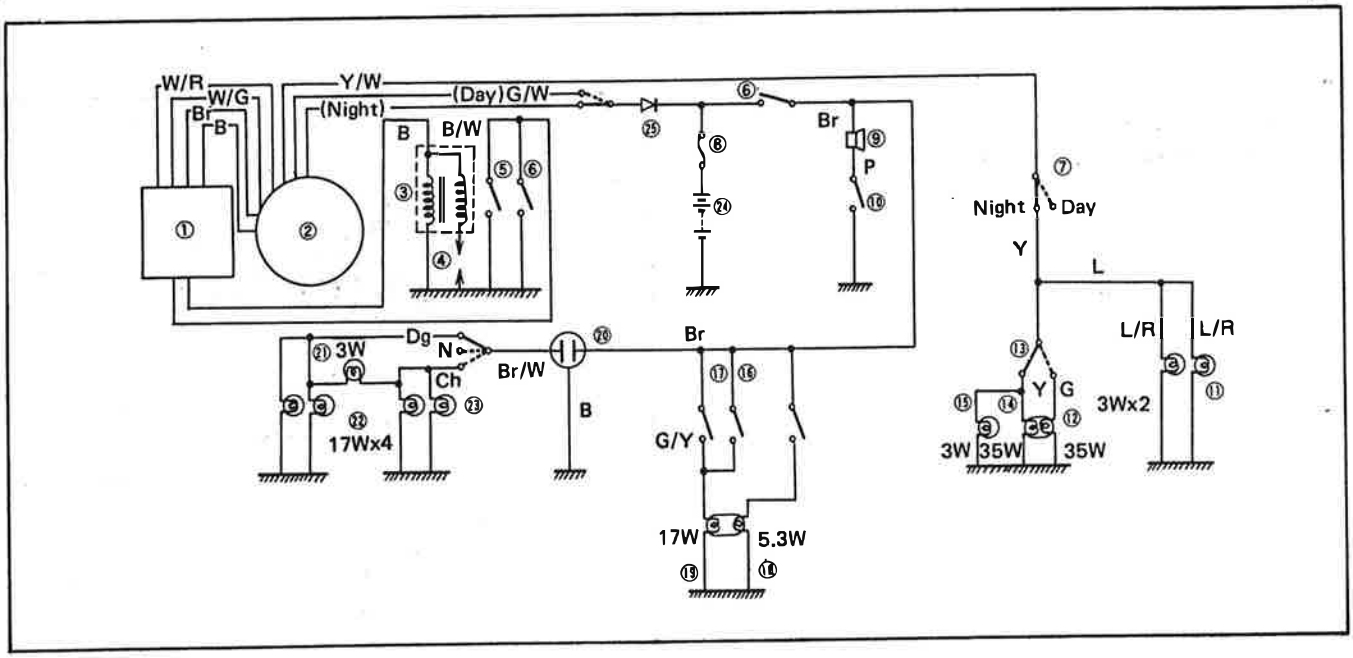
DT250B



1. F.W.M.
2. Ignition coil
3. Spark plug
4. Kill switch
5. Engine stop switch
6. Lighting switch
7. Fuse
8. Main switch
9. Horn
10. Horn button
11. Meter lamp
12. Dimmer switch
13. Low beam
14. High beam
15. High beam indicator
16. Rear stop switch
17. Front stop switch
18. Tail lamp
19. Stop lamp
20. Flasher relay
21. Flasher indicator
22. Flasher lamp
23. Flasher switch
24. Battery
25. Silicon rectifier

Fig. 6-7-5

DT400B

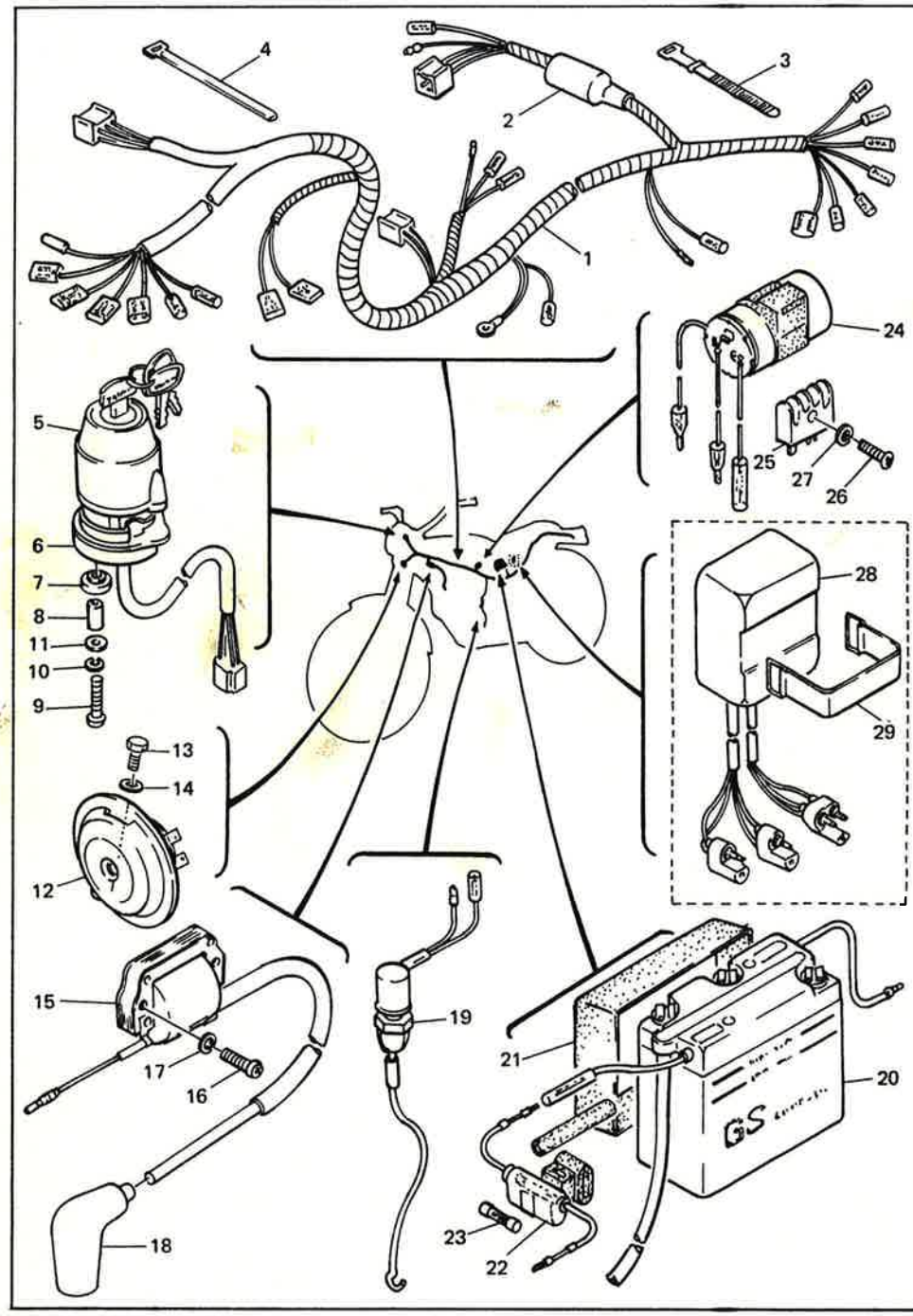


1. C.D.I. unit
2. F.W.M.
3. Ignition coil
4. Spark plug
5. Engine stop switch
6. Main switch
7. Lighting switch
8. Fuse
9. Horn
10. Horn button
11. Meter lamp
12. Low beam
13. Dimmer switch
14. High beam
15. High beam indicator
16. Rear stop switch
17. Front stop switch
18. Taillight
19. Stop lamp
20. Flasher relay
21. Flasher indicator
22. Flasher lamp
23. Flasher switch
24. Battery
25. Silicon rectifier

Fig. 6-7-6

W	White	L	Blue	G/W	Green/White
Br	Brown	W/G	White/Green	B/W	Black/White
Y	Yellow	W/R	White/Red	L/R	Blue/Red
G	Green	Br/W	Brown/White	Dg	Dark Green
B	Black	Y/W	Yellow/White	Ch	Dark Brown
R	Red	G/R	Green/Red		
P	Pink	G/Y	Green/Yellow		

Electrical



1. Wire harness assembly
2. Connector cover
3. Switch cord band
4. Band
5. Main switch assembly
6. Main switch damper
7. Main switch damper 2
8. Main switch collar
9. Plain washer
10. Spring washer
11. Panhead screw
12. Horn
13. Bolt
14. Spring washer
15. Ignition coil assembly
16. Panhead screw
17. Spring washer
18. Plug cap assembly
19. Stop switch assembly
20. Battery assembly
21. Battery band
22. Fuse holder assembly
23. Fuse (6V -10A.)
24. Flasher relay assembly
25. Rectifier assembly
26. Panhead screw
27. Spring washer
28. C.D.I. unit assembly (DT400B)
29. Battery fitting band (DT400B)

Fig. 6-7-7

CHAPTER 7. APPENDICES

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Consumer information 144

7

7

Troubleshooting guide

The following guide is not complete in itself. If a problem is found within an individual component mentioned within the chart, refer to the section or chapter involved for inspection procedures.

No Start or Difficult to Start

Ignition System	
Possible Cause	Remedy
No Spark.	1. Check Ignition Main Switch. 2. Check Ignition Kill Button. 3. Check Point Assembly, DT250B. 4. Check Condenser, DT250B 5. Check Wiring, Magneto Coil 6. Check Coil. 7. Check High Tension Lead. 8. Check Spark Plug. 9. Check Ignition Timing.
Weak or Intermittent Spark.	1. Use Electro Tester, Spark Gap Test. 2. Check Spark Plug. 3. Check High Tension Lead. 4. Check Ignition Assembly.
Air/Fuel Systems	
Possible Cause	Remedy
No Fuel.	1. Check Fuel Tank. 2. Check Petcock. 3. Remove Main Jet, Check Fuel Flow
Intermittent or Poor Fuel Flow.	1. Clean Fuel Tank, Check Cap Vent. 2. Clean Petcock. 3. Remove Carburetor, Service.
Bad Fuel.	1. Flush Fuel System, Complete. 2. Add Fresh Fuel, Proper Grade.
Blocked Air Intake or Malfunction.	1. Clean and Lube Filter. 2. Check Reed Valve Assembly.
Engine/Exhaust Systems	
Possible Cause	Remedy
Incorrect Compression Pressure.	1. If Reading too High, Check for Excessive Carbon. 2. If Reading too Low, Check: a. Cylinder Head Gasket. b. Cylinder base gasket. c. Piston, Rings, Cylinder.
Poor Bottom End Compression.	1. Check Crankcase Seals L. & R.

Possible Cause	Remedy
Blocked Exhaust System.	1. Check Muffler/Spark Arrester. 2. Check Exhaust Port Carbon Formation. 3. Check Exhaust Pipe for Internal Damage.

Poor Idle and Low Speed Performance

Ignition System	
Possible Cause	Remedy
Spark Plug Fouled or Incorrect Gap.	1. Clean and Gap, or Replace if Necessary.
Contact Points Bad (DT250B)	1. Clean and Gap, or Replace if Necessary.
Incorrect Ignition Timing.	1. Reset Timing.
Weak Spark.	1. Check Ignition Coil and Condenser.
Air/Fuel Systems	
Possible Cause	Remedy
Tank Cap Vent Plugged.	1. Clean or Repair as Necessary.
Fuel Petcock Plugged.	1. Clean or Repair as Necessary.
Carburetor Slow Speed System Inoperative.	1. Clean or Repair as Necessary.
Air/Fuel Systems	
Possible Cause	Remedy
Pilot Screw Out of Adjustment or Plugged.	1. Clean or Repair as Necessary.
Carburetor Float Level Incorrect.	1. Clean or Repair as Necessary.
Starter Lever on.	1. Clean or Repair as Necessary.
Air Leak.	1. Clean or Repair as Necessary.
Carburetor Not Level.	1. Clean or Repair as Necessary.
Engine/Exhaust Systems (See "No Start").	

Poor Mid-Range and High Speed Performance

Ignition Systems	
Possible Cause	Remedy
Spark Plug Incorrect.	1. Clean and Gap or Change Plug if Necessary.
Advance Defective (DT400B).	1. Check for Correct "Retard" to "Full Advance" Position.
Ignition Timing Incorrect.	1. Reset.
Points Set too Close (DT250B).	1. Regap.
Air/Fuel Systems	
Possible Cause	Remedy
Dirty Air Filter Element.	1. Clean.
Carburetor Float Level Incorrect.	1. Measure and Change if Required.

Possible Cause	Remedy
Incorrect Main Jet Size.	1. Remove Jet and Check Size.
Incorrect Jet Needle Notch.	1. Check Position of Clip in Needle.
Cracked or Leaking Reeds.	1. Remove.
Carburetor Not Level.	1. Level.

Conversion tables

Metric to Inch System

	Known	Multiplier (Rounded Off)	Result
Torque	m-kg.	7.235	ft-lbs
	m-kg.	86.82	in.-lbs
	cm-kg.	.0724	ft-lbs
	cm-kg.	.8682	in.-lbs
Weight	kg	2.205	lb
	g	.03527	oz
Flow/ Distance	Km/ℓ	2.352	mpg
	Km/hr	0.6214	mph
	Km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in.
	mm	0.03937	in.
Volume/ Capacity	cc (cm^3)	0.03381	oz (U.S. liq.)
	cc (cm^3)	0.06102	cu in.
	ℓ (Liter)	2.1134	pt (U.S. liq.)
	ℓ (Liter)	1.057	qt (U.S. liq.)
	ℓ (Liter)	0.2642	gal (U.S. liq.)
Misc.	kg/mm	56.007	lb/in.
	kg/cm^2	14.2234	psi ($lb/in.^2$)
	Centigrade (°C)	9/5(°C) + 32	Fahrenheit (°F)

Inch to Metric System

	Known	Multiplier (Rounded Off)	Result
Torque	ft-lbs	0.13826	m-kg.
	in.-lbs	0.01152	m-kg.
	ft-lbs	13.825	cm-kg.
	in.-lbs	1.1518	cm-kg.
Weight	lb	0.4536	kg
	oz	28.35	g
Flow/ Distance	mpg	0.4252	Km/ℓ
	mph	1.609	Km/hr
	mi	1.609	Km
	ft	0.3048	m
	yd	0.9144	m
	in.	2.54	cm
	in.	25.4	mm
Volume/ Capacity	oz (U.S. liq.)	29.57	cc (cm^3)
	cu in.	16.387	cc (cm^3)
	pt (U.S. liq.)	0.4732	ℓ (Liter)
	qt (U.S. liq.)	0.9463	ℓ (Liter)
	gal (U.S. liq.)	3.7853	ℓ (Liter)
Misc.	lb/in.	0.017855	kg/mm
	psi ($lb/in.^2$)	0.07031	kg/cm^2
	Fahrenheit (°F)	5/9(°F-32)	Centigrade(°C)

Definition of Terms:

m-kg = Meter Kilograms: Usually torque.
g = Gram(s).
kg = Kilogram(s): 1,000 grams.
km = Kilometer(s).
l = Liter(s).
km/l = Kilometer(s) Per Liter: Mileage.
cc = Cubic Centimeter(s) (cm^3): Volume or Capacity.
kg/mm = Kilogram(s) Per Millimeter: Usually Spring Compression Rate.
kg/cm^2 = Kilogram(s) Per Square Centimeter: Pressure.

Millimeters to Inches

	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0		0.0039	0.0079	0.0118	0.0157	0.0197	0.0236	0.2760	0.0315	0.0354
1	0.0394	0.0433	0.0472	0.0512	0.0551	0.0591	0.0630	0.0669	0.0709	0.0748
2	0.7890	0.0827	0.0866	0.0906	0.0945	0.0984	0.1024	0.1063	0.1102	0.1142
3	0.1181	0.1200	0.1260	0.1299	0.1339	0.1378	0.1417	0.1457	0.1496	0.1535
4	0.1575	0.1614	0.1654	0.1693	0.1732	0.1772	0.1811	0.1850	0.1890	0.1929
5	0.1969	0.2000	0.2047	0.2087	0.2126	0.2165	0.2205	0.2244	0.2283	0.2323
6	0.2362	0.2402	0.2441	0.2480	0.2520	0.2559	0.2598	0.2638	0.2677	0.2717
7	0.2756	0.2795	0.2835	0.2874	0.2913	0.2953	0.2992	0.3031	0.3071	0.3110
8	0.3150	0.3189	0.3228	0.3268	0.3307	0.3346	0.3386	0.3425	0.3465	0.3504
9	0.3543	0.3583	0.3622	0.3661	0.3701	0.3740	0.3780	0.3819	0.3858	0.3898
10	0.3937	0.3976	0.4016	0.4055	0.4094	0.4134	0.4173	0.4213	0.4252	0.4291

0.01 mm = 0.0004" 0.03 mm = 0.0012" 0.05 mm = 0.0020" 0.07 mm = 0.0028" 0.09 mm = 0.0035"
0.02 mm = 0.0008" 0.04 mm = 0.0016" 0.06 mm = 0.0024" 0.08 mm = 0.0031" 0.10 mm = 0.0039"

Inches to Millimeters

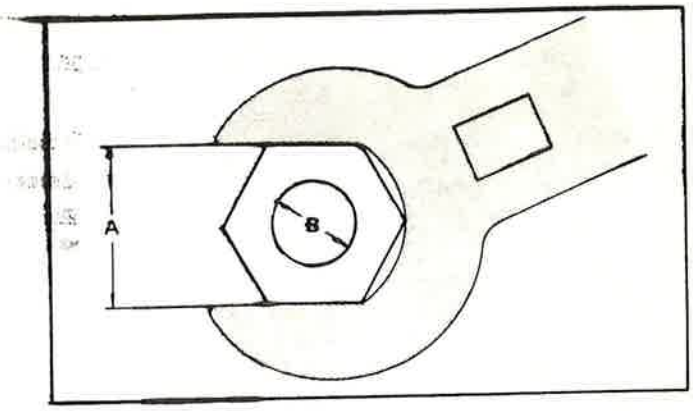
	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0		0.254	0.508	0.762	1.016	1.270	1.524	1.778	2.032	2.286
0.1	2.540	2.794	3.048	3.302	3.556	3.810	4.064	4.318	4.572	4.826
0.2	5.080	5.334	5.588	5.842	6.096	6.350	6.604	6.858	7.112	7.366
0.3	7.620	7.874	8.128	8.382	8.636	8.890	9.144	9.398	9.652	9.906
0.4	10.160	10.414	10.668	10.922	11.176	11.430	11.684	11.938	12.192	12.446
0.5	12.700	12.954	13.208	13.462	13.716	13.970	14.224	14.478	14.732	14.986
0.6	15.240	15.494	15.748	16.002	16.256	16.510	16.764	17.018	17.272	17.526
0.7	17.780	18.034	18.288	18.542	18.796	19.050	19.304	19.558	19.812	20.066
0.8	20.320	20.574	20.828	21.082	21.336	21.590	21.844	22.098	22.352	22.606
0.9	22.860	23.114	23.368	23.622	23.876	24.130	24.384	24.638	24.892	25.146
1.0	25.400	25.654	25.908	26.162	26.416	26.670	26.924	27.178	27.432	27.686

0.001" = 0.0254 mm 0.003" = 0.0762 mm 0.005" = 0.1270 mm 0.007" = 0.1778 mm 0.009" · 0.2286 mm
0.002" = 0.0508 mm 0.004" = 0.1016 mm 0.006" = 0.1524 mm 0.008" = 0.2032 mm 0.010" = 0.254 mm

Torque specifications

The list at right covers those stud/bolt sizes with standard I.S.O. pitch threads. Torque specifications for components with thread pitches other than standard are given within the applicable chapter.

Torque specifications call for dry, clean threads. Components such as the cylinder or cylinder head should be at room temperature prior to torquing. A cylinder head or any other item with several fasteners should be torqued down in a cross-hatch pattern in successive stages until torque specification is reached. The method is similar to installing an automobile wheel and will avoid warping the component.



A (Nut)	B (Bolt)	Torque Specification		
		m-kg.	ft-lbs	in.-lbs
10mm	6mm	1.0	7.0	85
13mm	8mm	2.0	15	175
14mm	8mm	2.0	15	175
17mm	10mm	3.5 - 4.0	25 - 30	300 - 350
19mm	12mm	4.0 - 4.5	30 - 35	350 - 400
22mm	14mm	4.5 - 5.0	30 - 35	400 - 400
26mm	17mm	6.0 - 7.0	40 - 50	500 - 600
27mm	18mm	6.0 - 7.0	40 - 50	500 - 600
30mm	20mm	7.0 - 8.0	50 - 60	600 - 700
Spark Plug		2.5 - 3.0	20 - 22	230 - 250

Section Parts to Tightened	Size		Tightening Torque
Engine			
Cylinder Head	M8	P1.25	2.1 – 2.5 m-kg.
Cylinder	M10	P1.25	4.2 – 4.5 m-kg.
Magneto	M12	P1.25	7.0 – 7.5 m-kg.
Spark Plug	M14	P1.25	2.5 – 3.0 m-kg.
Blind Plug	M14	P1.25	2.5 – 3.0 m-kg.
Decompression	M22	P1.25	2.5 – 3.0 m-kg.
Banjo Bolt	M6	P1.0	0.4 – 0.5 m-kg.
Reed Valve	M3	P0.6	0.07 – 0.09 m-kg.
Change Adjusting Screw	M8	P1.25	1.8 – 2.2 m-kg.
" " "	M6	P1.0	0.7 – 1.1 m-kg.
Ratchet Wheel Guide	M6	P1.0	0.75 – 1.2 m-kg.
Drive Sprocket	M18	P1.0	7.0 – 9.0 m-kg.
Clutch	M18	P1.0	7.0 – 8.0 m-kg.
Primary Drive Gear	M18	P1.0	7.0 – 9.0 m-kg.
Drain Plug	M14	P1.25	2.0 – 2.5 m-kg.
Change Lever	M6	P1.0	0.7 – 1.1 m-kg.
Kick Crank	M8	P1.25	1.8 – 2.9 m-kg.
Stopper Screw Cam Shift	M14	P1.5	2.0 – 2.5 m-kg.
Frame			
Engine Mount	M10	P1.25	4.5 – 5.5 m-kg.
" "	M8	P1.25	2.5 – 2.9 m-kg.
Pivot Shaft	M14	P1.25	10.0 – 11.0 m-kg.
Rear Cushion	M10	P1.25	2.0 – 2.6 m-kg.
Handle Upper Holder	M8	P1.25	1.1 – 1.8 m-kg.
Handle Crown	M8	P1.25	1.1 – 1.8 m-kg.
Front Wheel	M14	P1.25	10.0 – 12.0 m-kg.
Brake Lever F.R	M6	P1.0	0.7 – 1.1 m-kg.
Spoke F.R	Nipple		0.3 m-kg.
Bead Spacer F.R	M8	P1.25	0.79 – 1.25 m-kg.
Rear Wheel	M16	P1.5	10.0 – 12.0 m-kg.
Tension Bar F.R	M8	P1.25	0.79 – 1.25 m-kg.
Sprocket Wheel Gear	M10	P1.25	2.0 – 2.6 m-kg.
Side Stand	M10	P1.25	4.0 – 4.8 m-kg.
Foot Rest	M10	P1.25	1.7 – 2.1 m-kg.
Front Fork Under Bracket	M8	P1.25	0.79 – 1.25 m-kg.

1975 MODEL DT250B

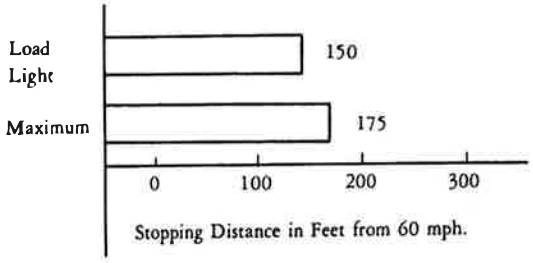
Notice

The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

STOPPING DISTANCE

This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system.

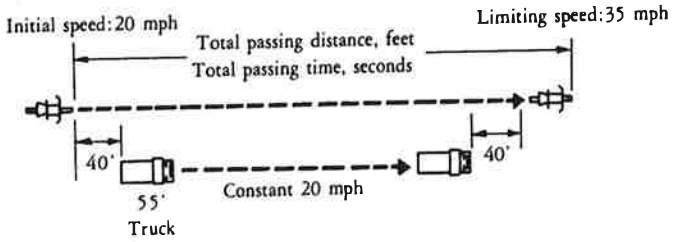
A. Fully Operational Service Brake



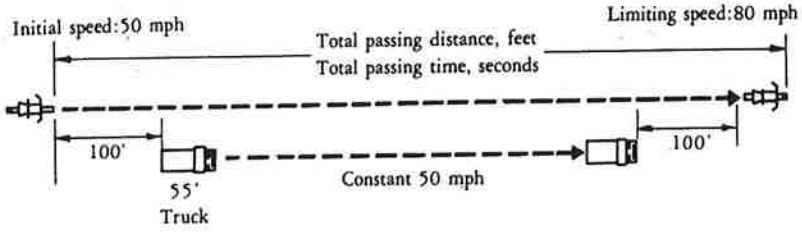
ACCELERATION AND PASSING ABILITY

This figure indicates passing times and distances that can be met or exceeded by the vehicles to which it applies, in the situations diagrammed below. The low-speed pass assumes an initial speed of 20 mph and a limiting speed of 35 mph. The high-speed pass assumes an initial speed of 50 mph and a limiting speed of 80 mph.

LOW SPEED PASS



HIGH SPEED PASS



SUMMARY

Low-speed pass	360 feet;	7.4 seconds.
High-speed pass	1,300 feet;	14.1 seconds.

1975 MODEL DT40●B

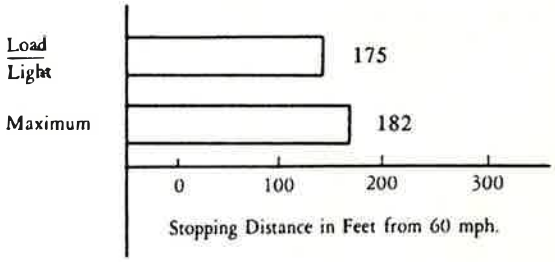
Notice

The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

STOPPING DISTANCE

This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system.

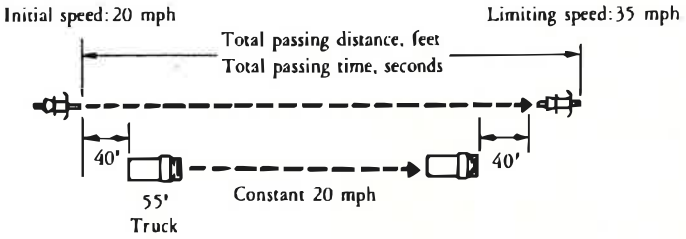
A. Fully Operational Service Brake



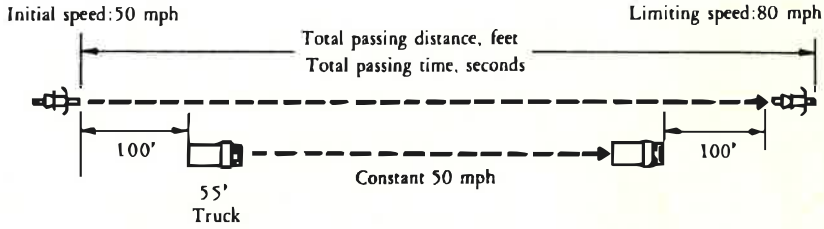
ACCELERATION AND PASSING ABILITY

This figure indicates passing times and distances that can be met or exceeded by the vehicles to which it applies, in the situations diagrammed below. The low-speed pass assumes an initial speed of 20 mph and a limiting speed of 35 mph. The high-speed pass assumes an initial speed of 50 mph and a limiting speed of 80 mph.

LOW SPEED PASS



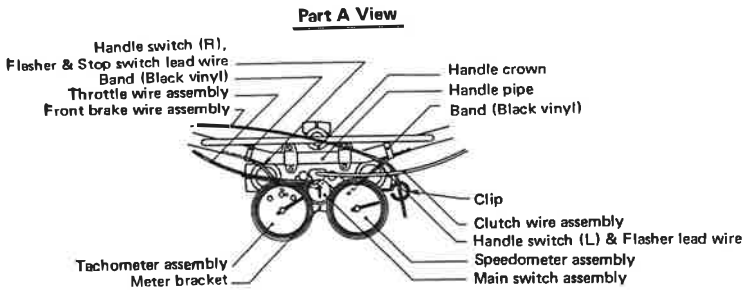
HIGH SPEED PASS

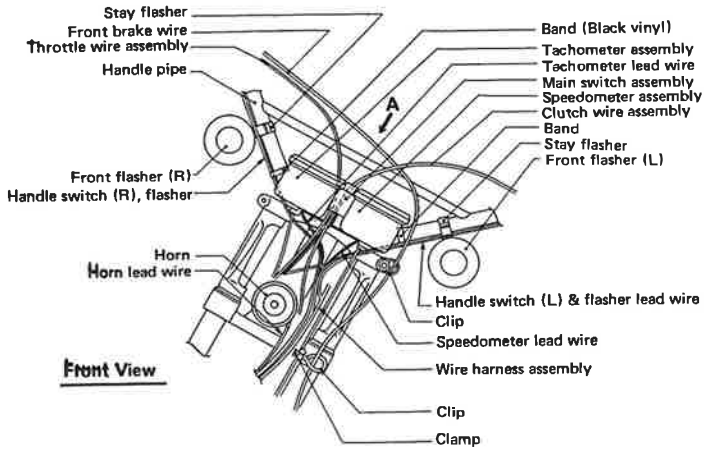


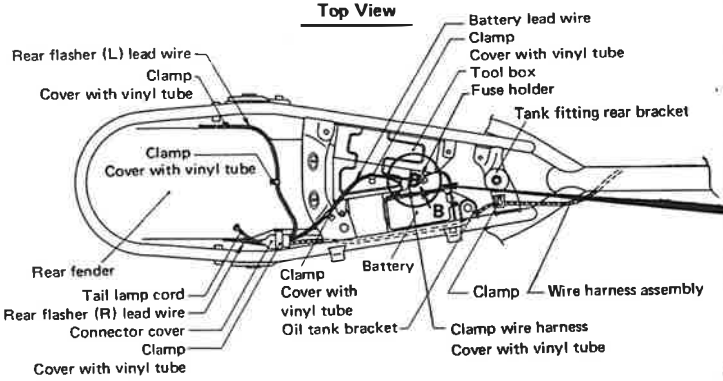
SUMMARY

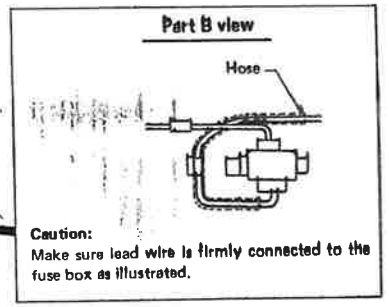
Low-speed pass ..... 352 feet; 7.2 seconds.
High-speed pass ..... 1,084 feet; 11.2 seconds.

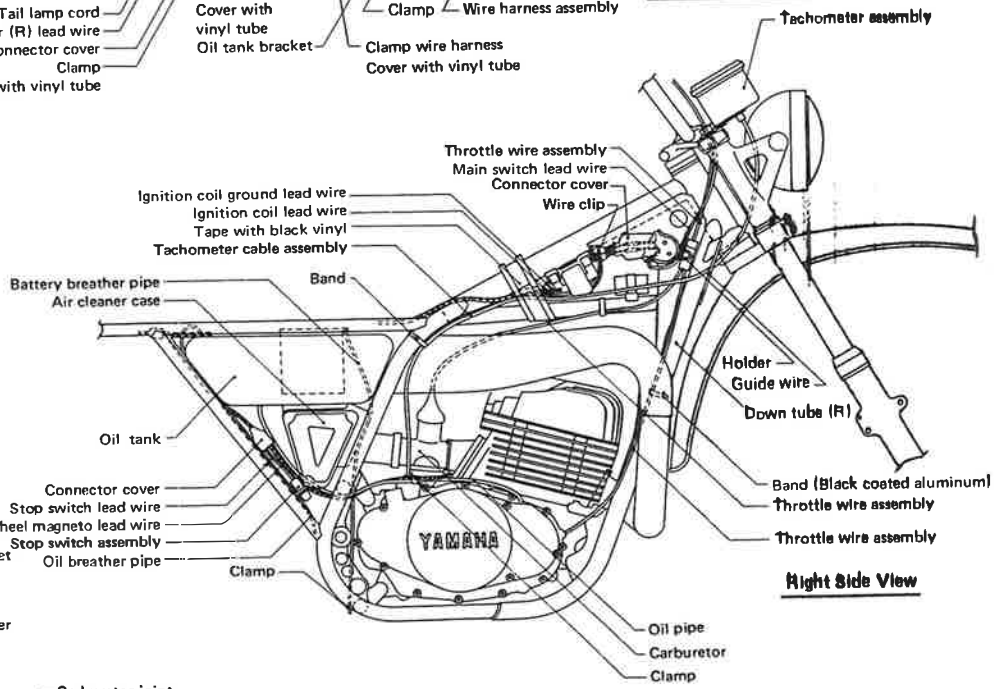
CABLE ROUTING DIAGRAMS

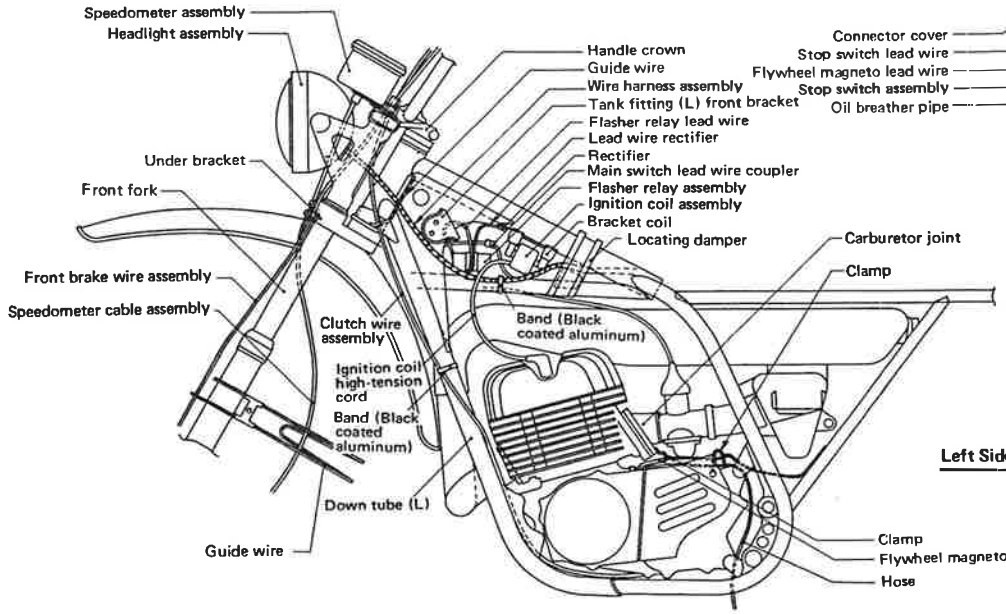


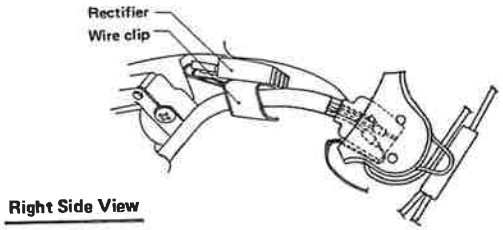






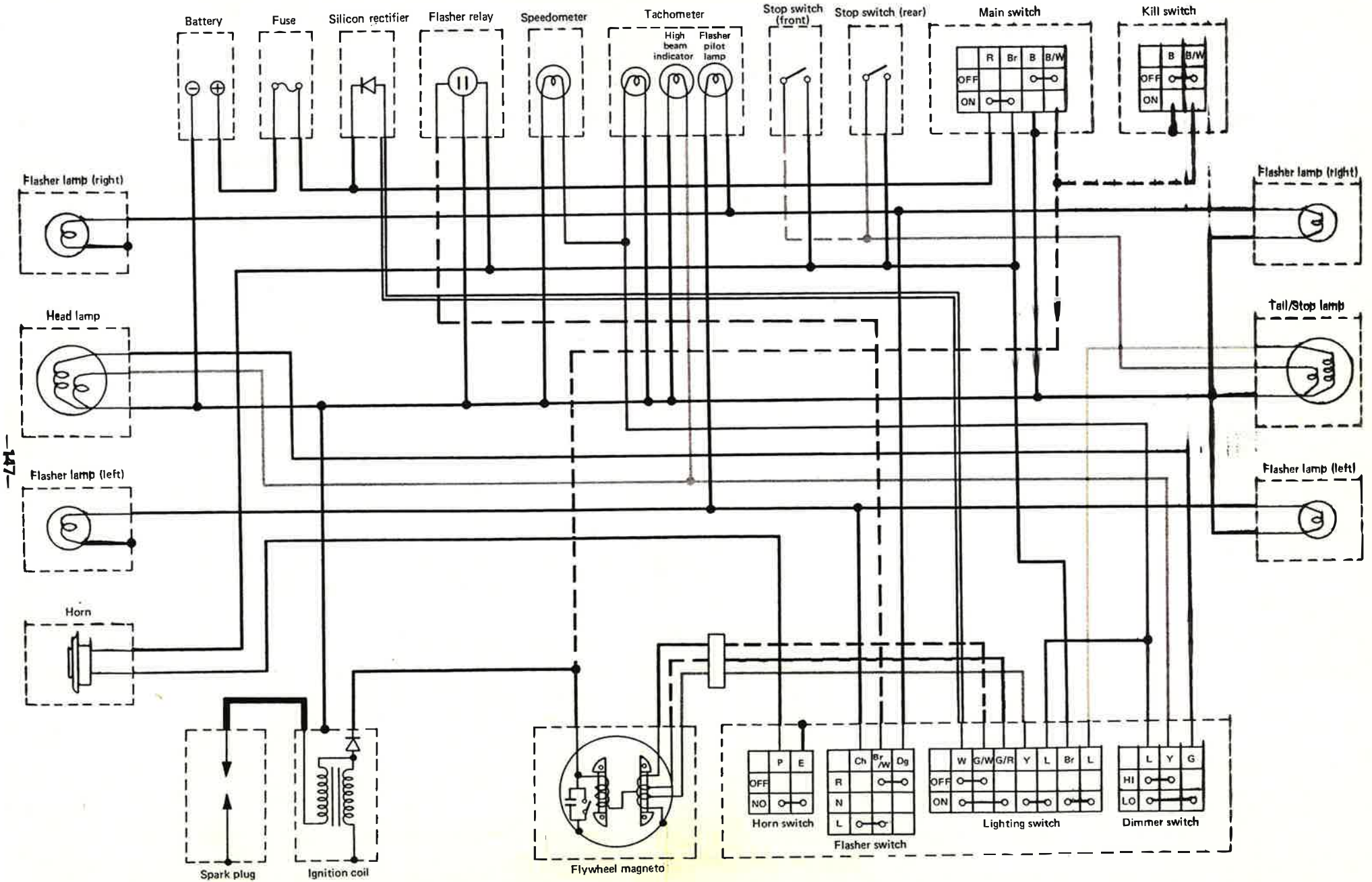






* Note:
Connect the stop switch lead wire to the harness of lead wire in the headlight body.

DT250B WIRING DIAGRAM



DT400B WIRING DIAGRAM