



YAMAHA

**SERIES DT1
(1968—1971)**

INCLUDES

DT1A - DT1B - DT1C

DT1S - DT1E

G.Y.T. - MX

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 knowlege, 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 Departments 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.

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FORWARD

This Service Manual is directed to acquaint both the owner and mechanic with the operation, service and maintenance of the DT1 series motorcycle as manufactured by Yamaha Motor Co., Ltd., Hamakita, Japan, during the model years 1968 through 1971. In essence, it is the original DT1E (1971) Service Manual with appropriate information for earlier models. In the rear of the manual you will also find G.Y.T. Kit and Motocross model information.

The DT1 was Yamaha's first fully street legal motorcycle designed to enable the owner to ride on the street, use for trail or enduro riding or convert (with factory available parts) into a competition-ready scrambler or motocrosser. It "made" the off-the-road market what it is today and we at Yamaha are justifiably proud of the marque.

This manual, and the technical and service information enclosed, should be closely followed to enable you to properly maintain the machine, thereby ensuring continuous good performance and long service life.

YAMAHA SERVICE DIVISION

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CHAPTER 1 GENERAL

1-1 Features of Yamaha Enduro 250

1. Single Cylinder 5-port Engine

The Yamaha DT1 250 c.c. single cylinder engine is the first of its kind ever produced by Yamaha. The iron sleeved aluminum cylinder is of 5-port design and its improved scavenging efficiency results in optimum engine performance in all gears from 2,500 to 6,000 R.P.M.

2. Convenient and Reliable Yamaha Autolube

Yamaha Autolube—automatic oil injection lubrication system—is well known for its performance and reliability. Like every other Yamaha model, the Yamaha Enduro 250 also employs the world-renowned Autolube

3. 5-Speed Wide Ratio Transmission

The Yamaha Enduro 250 assures steady engine performance from low speed off-road riding to high speed road work, because of the wide ratio 5-speed transmission. (DT1A-DT1B employ close ratio)

4. Convenient Primary Kickstarter

The primary kickstarter enables the engine to be started either in gear or in neutral.

5. Easy Riding Position and Superb Maneuverability

The light-weight sturdy frame combined with the component parts are ideal for off-the-road riding. Agile, and with a comfortable riding position, the Yamaha Enduro 250 exhibits superb maneuverability and handling over rough terrain.

6. Competition Designed Front Forks and Rear Shocks

The Yamaha Enduro 250 has telescopic front forks with internal coil springs such as used for competition racers.

The front forks provide excellent handling qualities over the roughest terrain with longer stroke and superb dampening capacity. The rear shocks have 3-way adjustable springs with a longer stroke.

This insures stability under even the roughest condition. (DT1E - 5 Way Adjustable)

7. Separate Tachometer and Speedometer with a Reset Odometer for Mileage Calibration.

A separate tachometer is provided to enable the rider to make best use of the engine power.

The speedometer combined with a trip meter allows the rider to reset the mileage for enduros.

8. Trials Universal Tires for Off-the-road and On the Road Riding.

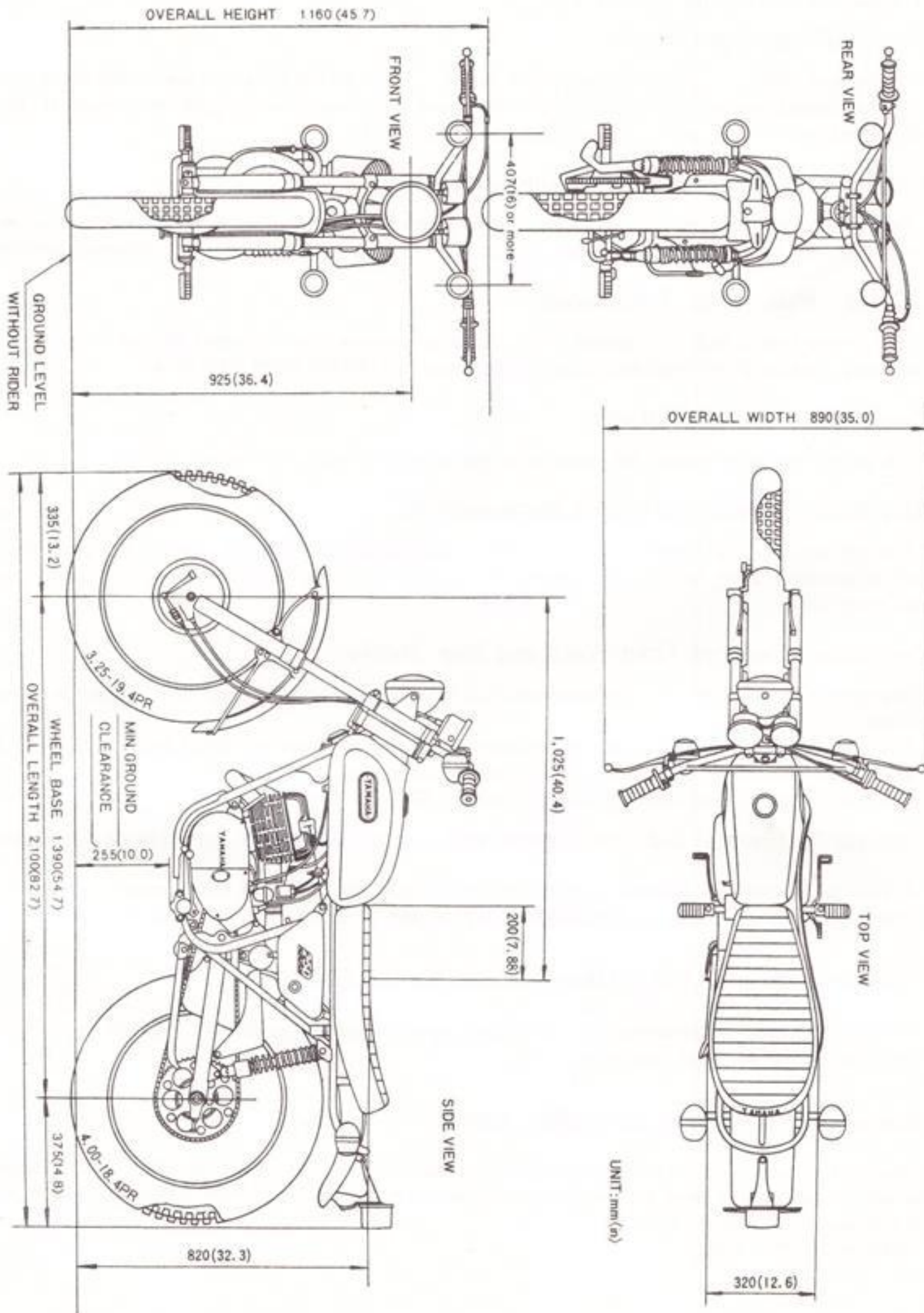
Trials universal tires for off-the-road and on the road riding are equipped as standard. They are ideal for off-the-road riding as well as on the road riding.

9. Alternate* GYT Parts for Competition Riding.

The GYT kit parts for competition engine tuning are available. You can convert your DT1 into a motorcrosser by simply installing GYT parts and removing all unnecessary parts. (DT1C and E model motocross parts can be used as an alternative to the DT1A GYT Kit.)

* Genuine Yamaha Tuning

1-2 External View



ALL MODELS

1. MODEL	DT-1	DT-1 GYT	Chassis :
2. BORE x STROKE (mm)	70x64	70x64	Tubular-Double loop
3. CAPACITY (cc)	246	246	Telescopic fork
4. COMPRESSION RATIO	6.8:1	8.2:1	Swinging arm
5. IGNITION TIMING BEFORE T.D.C. (inch)	0.126	0.091	Coil spring, oil damper
6. CONTACT BREAKER POINT GAP SETTING (inch)	3.2	2.3	Coil spring, oil damper
7. CONTACT BREAKER POINT GAP SETTING (mm)	0.011-0.013	0.011-0.013	
8. SPARK PLUG & SPARK GAP (mm) NGK	0.30-0.35	0.30-0.35	
9. VOLTAGE REGULATOR ADJUSTMENT (volt/rpm)	B-7E 0.5-0.6	B9E-B9EN 0.5-0.6	
10. CUTOFF RELAY ADJUSTMENT (volt)			
11. CONDENSOR CAPACITY (microfarad)	0.0016-0.0018	0.0016-0.0020	
12. PISTON CLEARANCE-SKIRT (inch)	0.040-0.045	0.040-0.050	
13. PISTON CLEARANCE-SKIRT (mm)	VM26SH (214E) **	VM30SH (214H) **	
14. CARBURETOR TYPE (Makuni)	150	210	
15. MAIN JET (#)	0.5	0.5	
16. AIR JET	0.2	0.4	
17. NEEDLE JET	5D1-3	8J-5D05-3	
18. JET NEEDLE	2.5	5.5	
19. CUT AWAY	35	80	
20. PILOT JET (#)	1-1/2	1/2	
21. AIR SCREW (turns out)	60	60	
22. STARTER JET (#)			
23. PRIMARY REDUCTION RATIO	65/21	65/21	
24. SECONDARY REDUCTION RATIO	44/15	44/14	
25. GEAR BOX GEAR RATIO & 1st	29/13	29/13	
26. OVERALL GEAR RATIO 2nd	26/16	26/16	
27. 3rd	23/19	23/19	
28. 4th	21/21	21/21	
29. 5th	19/23	19/23	
30. GEAR BOX OIL CAPACITY (quart)	1.06	1.06	
31. OIL TANK CAPACITY (quart)	1.7	1.7	
32. FUEL TANK CAPACITY (gallon)	2.4	2.4	
33. FRONT FORK OIL CAPACITY (oz) B	7.1 oz each	7.1	
34. (cc) B	210 cc each	210	
35. TIRE SIZE FRONT	3.25x19	3.25x19	
36. TIRE SIZE REAR	4.00x18	4.00x18	
37. TIRE PRESSURE FRONT (lb.)	12-14	10*	
38. REAR (lb.)	16-18	12*	
39. CHAIN TENSION (UP & DOWN) (inch)			
40. OIL PUMP ADJUSTMENT STROKE MIN. (mm)	0.20-0.25	0.20-0.25*	
41. STROKE MAX. (mm)	1.85-2.05	1.85-2.05*	
OPERATING CABLE ADJUSTMENT			
	At Idle	At Idle	
*Without Autolube, follow oil manufacturer's recommendation - premix oil to gas ratio.			

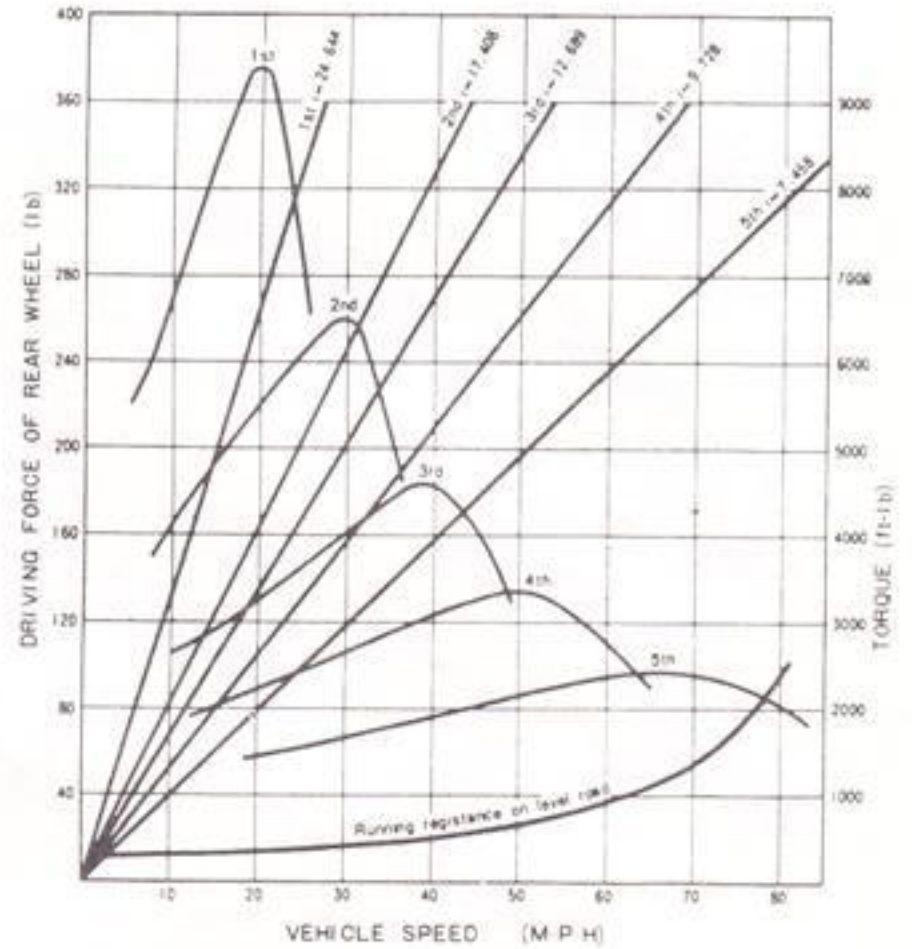
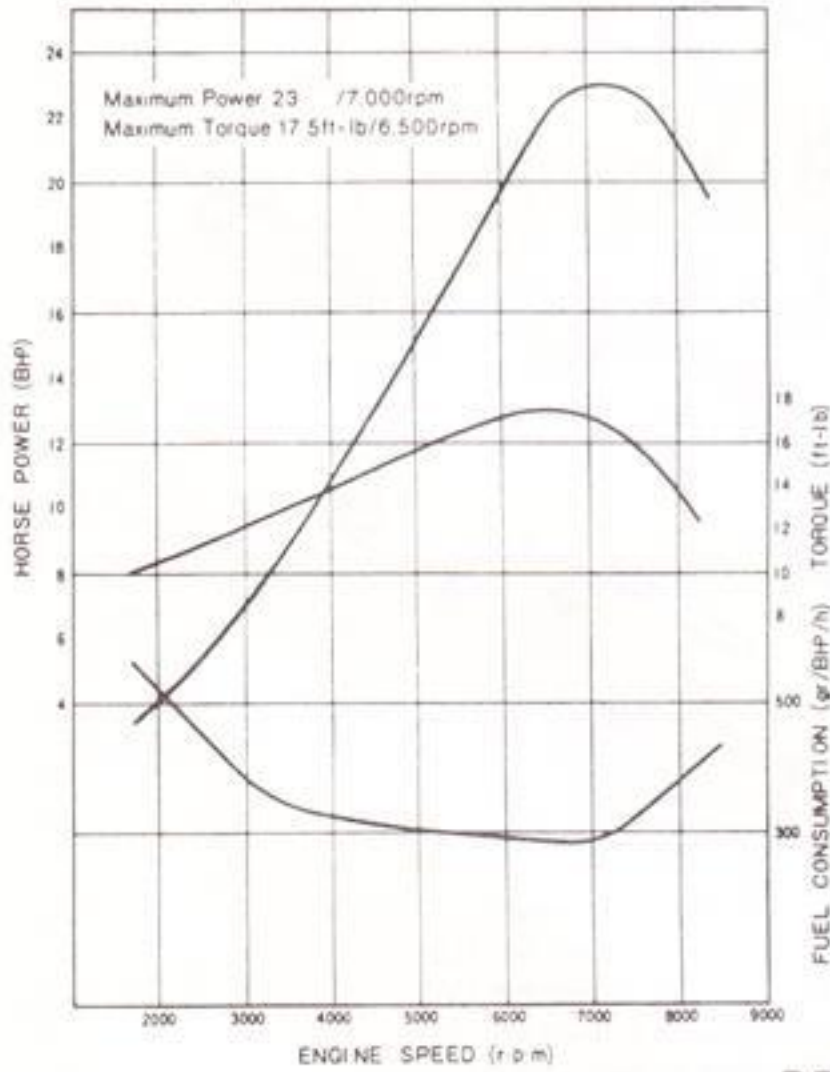
1. MODEL	DTIB	DTIC	DTIC-MX	DTI-E	DTIE-MX
2. HORSEPOWER @ RPM	21-7000	23 - 7000	30 - 7000	28 - 7,000	30 - 7,000
3. TORQUE @ RPM	16.8-5000	17.5 - 6500	22.4 - 6500	17.5 - 6,500	22.4 - 6,500
4. BORE & STROKE (mm)	70 x 64	70 x 64	70 x 64	70 x 64	70 x 64
5. ENGINE DISPLACEMENT	246cc	246cc 15 cu. in.	246cc 15 cu. in.	246cc 15.0 cu. in.	246cc 15.0 cu. in.
6. NET WEIGHT (Approx.)	232	232 lbs.	229 lbs.	245 lbs.	232 lbs.
7. COMPRESSION RATIO	6.8:1	6.4:1	8.2:1	6.8:1	8.2:1
8. IGNITION TIMING @ T.D.C. (mm) Retarded Advanced	3.2mm ± 0.1	3.2mm ± 1	2.3mm	3.2mm ± 1	2.3mm ± 1
9. CONTACT BREAKER POINT GAP SETTING (mm) (inch)	.011 - .013"	3.35mm 0.11-.013"	3.35mm 0.11-.013"	.30-.40mm .012-.015"	.30-.40mm .012-.015"
10. SPARK PLUG AND GAP (mm)	B7E (R) 5 - 6mm	B-7E 5-.6mm	B-10EN 5-.6mm	B-8ES 5-.6mm	B-10EN 5-.6mm
11. VOLT. REG. ADJ. (Volts @ rpm - no load)	MAGNETO	MAGNETO	MAGNETO	MAGNETO	MAGNETO
12. CUTOFF RELAY ADJ. (Cut in voltage)					
13. CONDENSER CAPACITY (Microfarad)	22uF	0.22uF	22uF	22uF	22uF
14. PISTON SKIRT CLEARANCE (mm) (inch)	.040 - .045	.040-.045mm .0016-.0018"	.045-.050mm .0018-.0020"	.040-.045mm .0016-.0018"	.045-.050mm .0018-.0020"
15. CARBURETOR TYPE & MANUFACTURER	VM265H	VM265H Mikuni	VM305H	VM265H Mikuni	VM305H Mikuni
MAIN JET (M.J.)	160	160	#210-220	#160	#210-220
AIR JET (A.J.)	5	0.5	0.5	0.5	0.5
NEEDLE JET (N.J.)	0-2	0-2	0-4	0-2 (or 0-4)	0-2 (or 0-4)
JET NEEDLE - clip position (J.N.)	5D1-3	5D1-3	5D5-4	5D1-3	5D5-4
CUTAWAY (C.A.)	2.5	2.5	3.5	2.5	3.5
PILOT JET (P.J.)	35	35	80	35	80
AIR SCREW (Turns out) (A.S.)	1 1/2	1 1/2	1	1 1/2	1.0
STARTER JET (S.J.)	60	60	60	60	60
FLOAT LEVEL (mm) (F.L.)	14.1*	15.1mm	25.5mm	15.1mm	25.5mm
AIR FILTER TYPE	Wet foam	Wet foam rubber	Wet foam rubber	Wet foam rubber	Wet foam rubber
17. PRIMARY REDUCTION RATIO & METHOD	3.095 (65/21)	65/21 3.095 gear	65/21 3.095 gear	65/21 3.095 gear	65/21 3.095 gear
18. SECONDARY REDUCTION RATIO & METHOD	2.933 (44/15)	44/14 3.143 chain	44/14 3.143 chain	44/14 3.143 chain	44/14 3.143 chain
19. TRANS. GEAR RATIOS 1st (Internal) (No. teeth) (Overall)	2.231 (29/13)	2.533 38/15 24.644	2.250 26/16 21.888	2.533 38/15 24.64	2.250 26/16 21.89
2nd	1.624 (26/16)	1.789 34/19 17.408	1.650 33/20 16.051	1.789 34/19 17.41	1.650 33/20 16.05
3rd	1.211 (23/19)	1.304 30/23 12.689	1.261 29/23 12.267	1.304 30/23 12.69	1.261 29/23 12.27
4th	1.000 (21/21)	1.000 26/26 9.728	1.000 26/26 9.728	1.000 26/26 9.73	1.000 26/26 9.73
5th	826 (19/23)	0.767 23/30 7.458	.793 23/29 7.714	.767 23/30 7.46	.793 23/29 7.71
20. TRANS. OIL CAPACITY (Qt.)	1000cc (1.06 qt.)	1.06	1.06	1.06	1.06
21. OIL TANK OR ENGINE SUMP CAPACITY (Qt.)	1.7	1.7	1.7	1.7	1.7
22. FUEL TANK CAPACITY (U.S. Gal.)	2.5	2.5	2.5	2.5	2.5
23. FRONT FORK OIL CAPACITY	7.1 210cc	7.1 oz. 210cc	7.1 oz. 210cc	5.9 oz 175cc	5.9 oz. 175cc
24. TIRE SIZE (Front)	3.25 x 19	3.25 x 19	2.75 x 21 knobby	3.25-19	2.75-21 knobby
(Rear)	4.00 x 18	4.00 x 18	4.00 x 18 knobby	4.00-18	4.00-18 knobby
25. TIRE PRESSURE (Lbs.) (Front) (off road)	14 *	14	14	13	13
(Rear) (off road)	17	17	17	16	16
26. DRIVE CHAIN TENSION (Up & down freelay)	20mm (25/32")	20mm 25/32"	20mm 25/32"	20mm 25/32"	20mm 25/32"
27. OIL PUMP STROKE ADJUSTMENT MIN. (mm)	20 - 25	20-.25mm	20-.25mm	20-.25mm	20-.25mm
MAX. (mm)	1.85 - 2.05	1.85-2.05mm	1.85-2.05mm	1.85-2.05mm	1.85-2.05mm
	At idle	At idle	At idle	At idle	At idle

1-4 Performance Curves

ENGINE PERFORMANCE CURVES

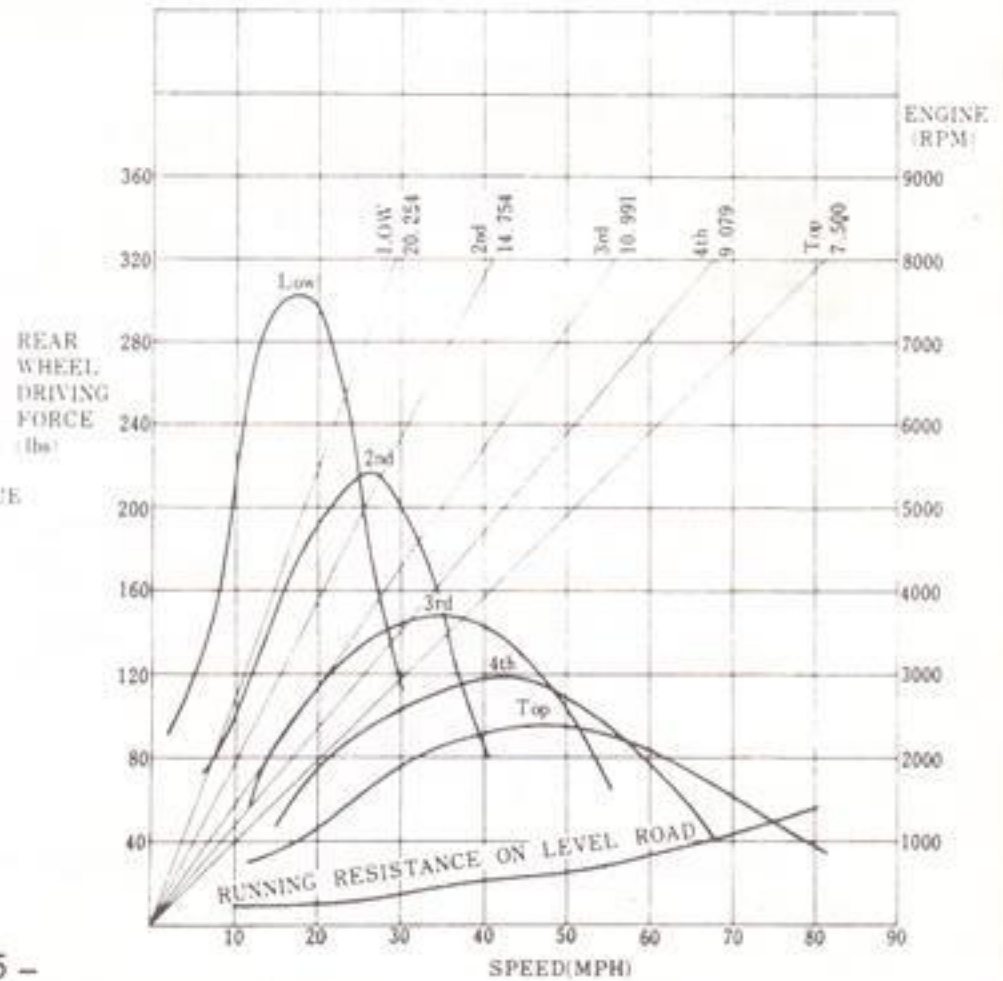
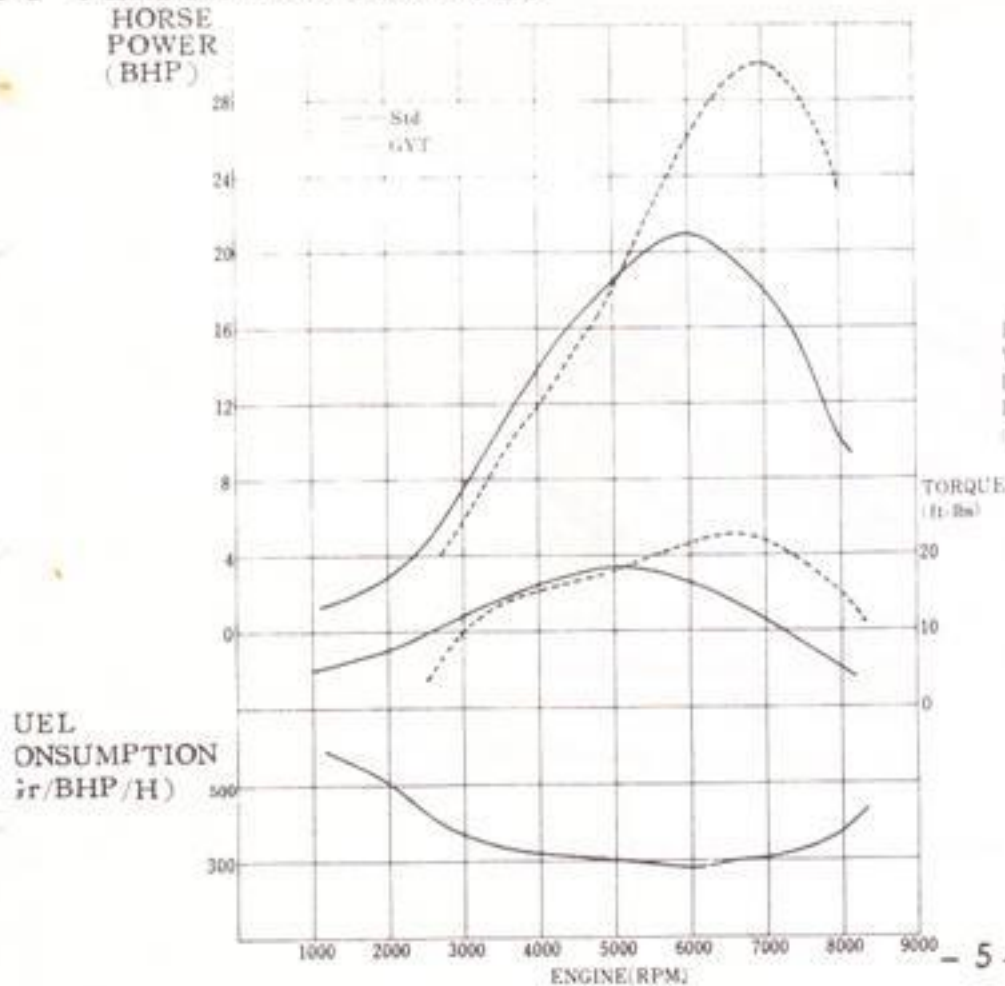
DT1C - DT1E - DT1S

DRIVING PERFORMANCE CURVES



I-4 PERFORMANCE CURVES

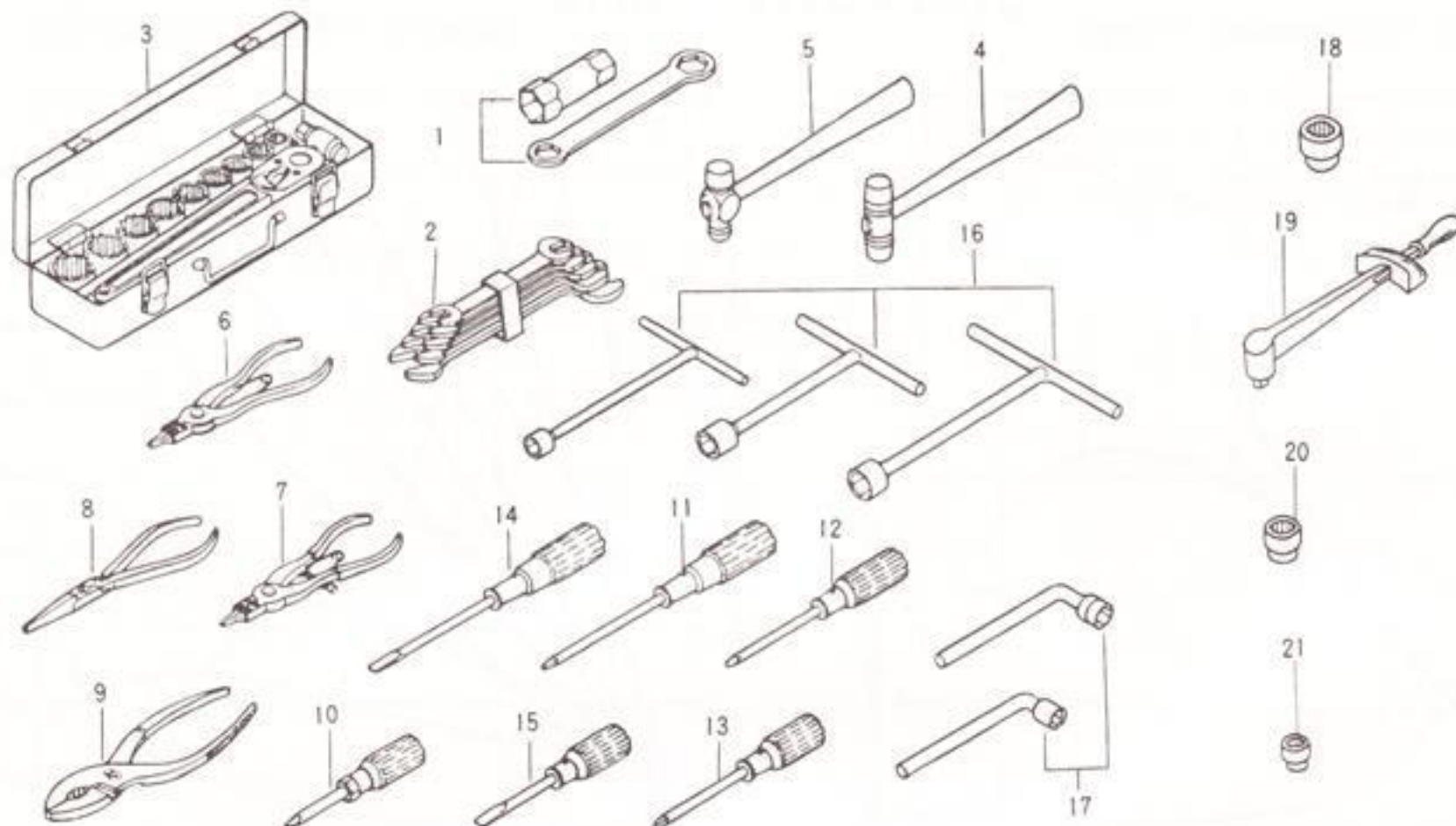
DT1A - DT1B



1-5 Tools and Instruments for Shop Service

The following tools and instruments are required to service the DT1-E:

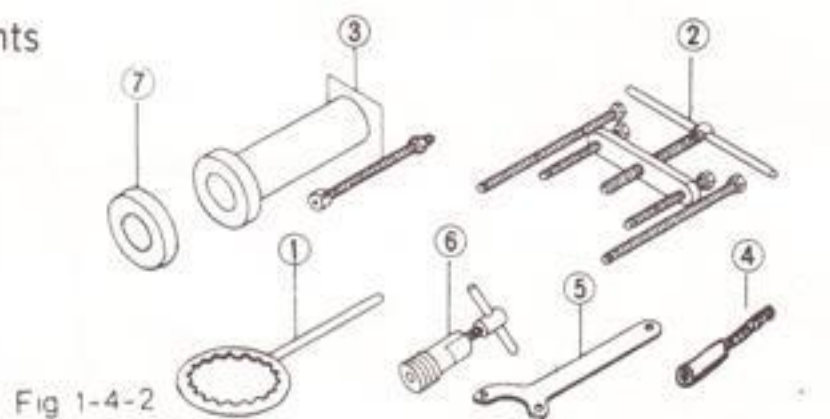
1. General Tools



- | | |
|-----------------------------|-----------------------------------|
| 1) Plug wrench 23 x 29mm | 10) Phillips-head screwdriver |
| 2) A set of wrenches | 11) Phillips-head screwdriver (L) |
| 3) A set of socket wrenches | 12) Phillips-head screwdriver (M) |
| 4) Plastic tip hammer | 13) Phillips-head screwdriver (S) |
| 5) Steel hammer | 14) Slot-head screwdriver (M) |
| 6) Circlip pliers (ST type) | 15) Slot-head screwdriver (S) |
| 7) Circlip pliers (TR type) | 16) T-handle socket wrench |
| 8) Needle nose pliers | |
| 9) Pliers | |

Fig 1-4-1

2. Special Tools and instruments



- | | |
|---|----------------------------------|
| 1) Clutch holding tool (for R5 and YM2) | 5) Flywheel magneto holding tool |
| 2) Crankcase disassembling tool | 6) Flywheel magneto puller |
| 3) Crankshaft assembling tool (for YF1 and YG1) | 4) Stand, dial gauge adaptor |
| | 7) Crankshaft puller pot adaptor |

In addition, an electro-tester, tachometer (engine r.p.m. meter) hydrometer, etc. are needed.

3. Other Materials



- | | |
|-----------------------|----------------------|
| 1) Yamaha Bond (No.5) | 5) Overhauling stand |
| 2) Autolube oil | 6) Parts tray |
| 3) Grease | 7) Oiler |
| 4) Wiping material | 8) Oil jug |

Fig 1-4-3

The use of a wooden box as shown in the above photo 5 will facilitate engine service and overhaul. Consumable parts (such as gaskets) and replacement parts must also be on hand.

MAINTENANCE CHART

This chart should be considered strictly as an example for general lubrication and maintenance periods. You must take into consideration that weather, terrain, geographical locations, and a variety of individual uses all tend to demand that this time schedule may have to be altered to match the machine's environment.

The schedule is oriented to the average pleasure rider who rides approximately 80% of the time on city streets and secondary roads. For the rider who spends 10 - 12 hours per week riding hard in the dirt, the periods must be reduced drastically. This is most especially important in such critical areas as lubrication. Air cleaners, for example, should be cleaned and re-oiled every 100 - 150 miles under hard usage. And yet, the average rider need only clean his every month or 1,000 miles, whichever comes first.

<u>ITEM</u>	<u>PERIOD</u>
CONTROLS (lube and/or adjust)	1,000/monthly
SUSPENSION (lube and/or change oil)	5,000/bi-annually
WHEELS (inc. spokes, pressure)	1,000/monthly
DECARBONIZE ENGINE & EXHAUST	2,000-4,000 (as nec'y)
AIR INTAKE (filter, etc.)	1,000/monthly
FUEL SYSTEM (petcock, tank, carb, clean/adj.)	2,000/quarterly
BATTERY (ck. level, chg. as nec'y.)	1,000/monthly
IGNITION SYSTEM (ck. timing, re-set, replace parts as nec'y.)	2,000/or as nec'y.
TRANSMISSION (ck. 500/weekly) refill (10W-30)	2,000/bi-annually
DRIVE CHAIN (ck. 250/weekly, adj. as nec'y.) Lubricate/clean	500/monthly
SPARK PLUG (ck. 1,000 clean/regap as nec'y.) Replace	2,000-4,000/bi-annually
NUTS AND BOLTS (before every trip)	DIRT: 100/daily STREET: 250/weekly

CHAPTER 2 YAMAHA AUTOLUBE (Separate Automatic Lubrication System)

2-1 What is Yamaha Autolube ?

Conventional 2-stroke engines are lubricated by oil pre-mixed in gasoline, but YAMAHA's Autolube furnishes an automatic, separate lubrication system. That is, the oil in a separate oil tank is automatically regulated by the oil pump and fed to the engine according to engine speed and load.

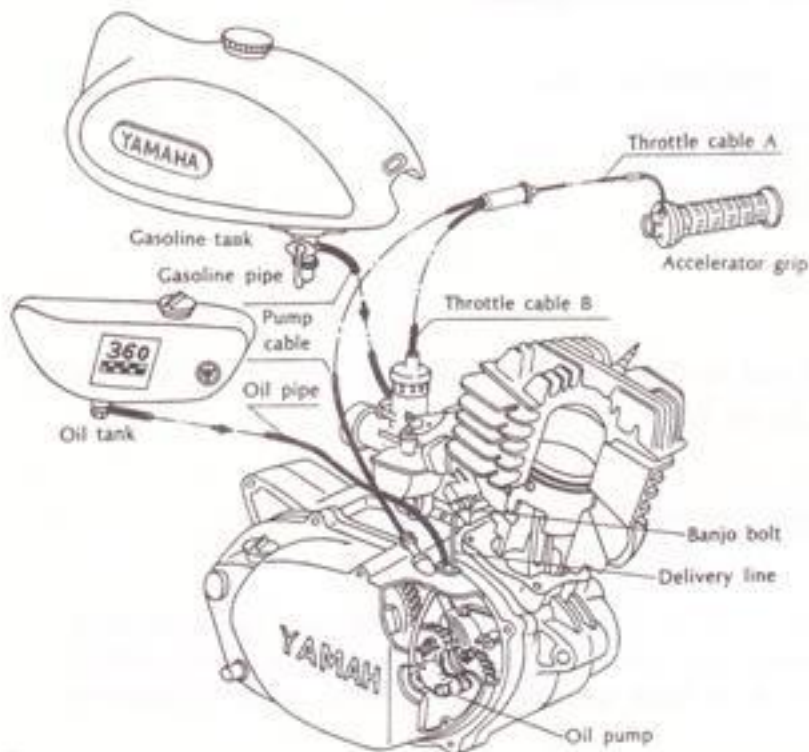


Fig. 2-1-1

2-2 Features of Yamaha Autolube

The oil pump is driven by the engine through a reduction gear, and is connected to the carburetor throttle cable controlled by the accelerator grip.

The oil pump automatically regulates the volume of lubricating according to engine speed and throttle valve opening, thus pumping the optimum amount of oil for engine lubrication under any operating condition.

This "automatic separate lubrication" does not merely eliminate disadvantages in the conventional pre-mix system, but it further improves the performance and efficiency of 2-stroke designs by eliminating certain oil-starvation condition which formerly existed.

- A) The Autolube feeds an optimum amount of lubricating oil to the engine under any operating condition, thus featuring :
 - Less oil consumption.
 - Less carbon accumulation.
 - Less exhaust smoke.
 - Improved lubricating efficiency.
- B) The Autolube simplifies fuel supply, thus featuring :
 - Using straight gasoline directly in the gas tank.
 - Less fuel contamination.
- C) The Autolube improves the reliability of lubrication, thus eliminating :
 - Special care concerning oil/fuel mixing ratio.

2-3 Handling the Oil Pump

The oil pump is a precision-machined assembly. Make no attempt to disassemble it. When you remove the oil pump from the engine, protect it from dust, dirt, etc., and after reinstalling it, bleed and adjust the pump correctly. Proper handling will keep the pump free from trouble.

The oil pump is similar in both mechanism and construction to other Autolube systems. The only difference is the employment of a 5.5 ϕ plunger because of larger consumption of oil by a 250c.c. single cylinder engine.

1 Checking Minimum Pump Stroke

a Checking

- 1) Fully close the accelerator grip.
- 2) Turn the oil pump starter plate in the direction of the arrow marked on the plate. Then measure the gap between the adjustment pulley and the adjust-

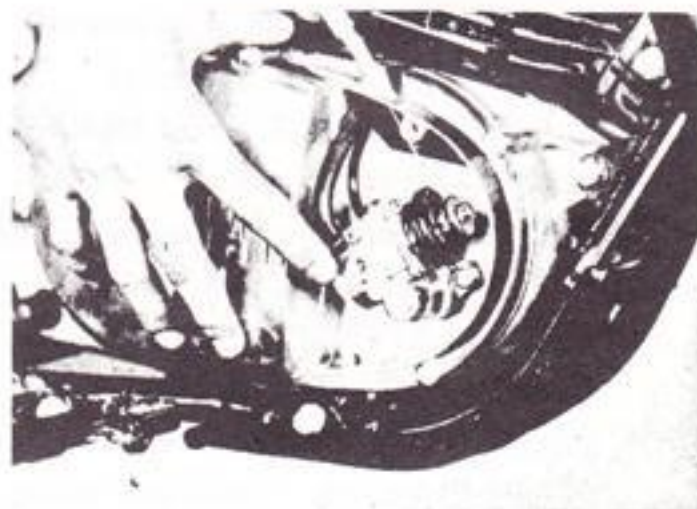


Fig 2-3-1

- ment plate. Keep the gap as wide as possible by observing it with the eye.
- 3) Insert a feeler gauge (0.15mm.) into the gap.
When the gap allows it to enterStroke is correct.
When the gap does not allow *ENTRY* Stroke..... is insufficient.

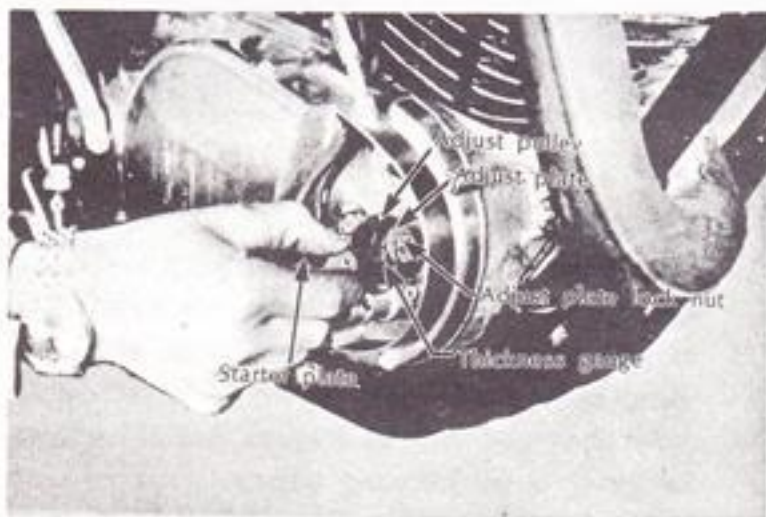


Fig 2-3-2

b Adjustment

- 1) Remove the adjustment plate lock nut, and then remove the adjustment plate.

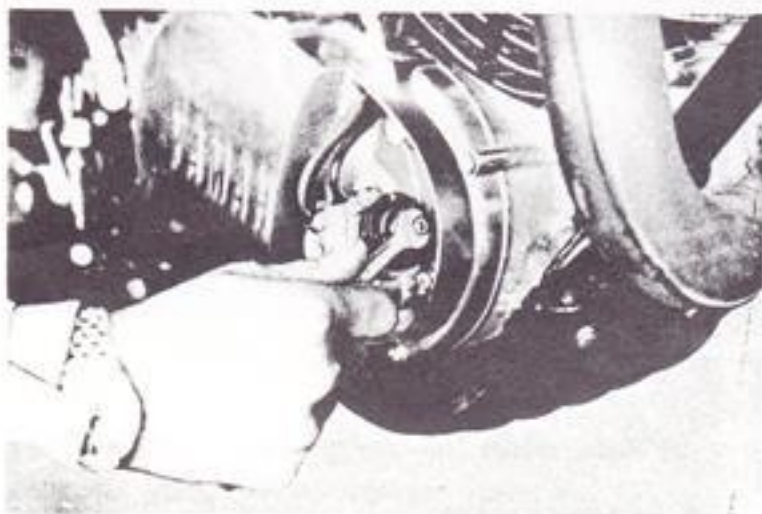


Fig 2-3-3

- 2) Install a 0.1mm. adjustment shim where the adjustment plate was. (Fig. 2-3-4)
- 3) Reinstall the adjustment plate lock nut, and measure minimum stroke. When the gap allows a 0.20 mm. feeler gauge to enter but does not allow a 0.25mm, the stroke is correctly adjusted.

Minimum stroke adjustment limite...0.15mm. or less
stroke adjustment tolerance.....0.20 to 0.25mm.



Fig 2-3-4

stroke adjustment tolerance.....0.20 to 0.25 mm.

2. Carburetor and Autolube Cable Adjustment

Perform the preceding steps in section 2-3-1 to check minimum stroke, and adjust it if incorrect. Then adjust the Autolube and carburetor cables.

a Throttle Cable Adjustment

- 1) To adjust the throttle cable free play with the engine at idle, begin by removing all slack from throttle cable B in Fig. 2-3-5.

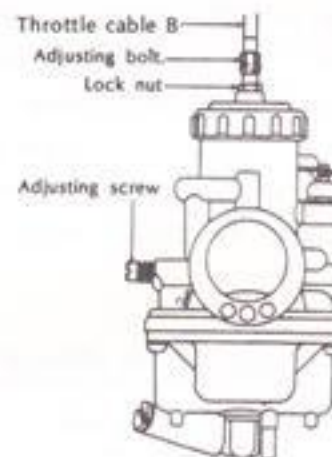


Fig 2-3-5

To remove all the free play from the throttle cable, loosen or tighten the throttle cable adjustment screw (see below) until all slack has been taken up. Next, screw the cable adjustor until there is 1mm free play (1/32") in the cable at the top the carburetor.

- 2) The next adjustment is at the throttle grip. Loosen the lock nut and screw the adjustor in or

out, whichever is necessary to get 0.5-1.0 mm of free play at the cable end. (see Fig.2-3-6.)

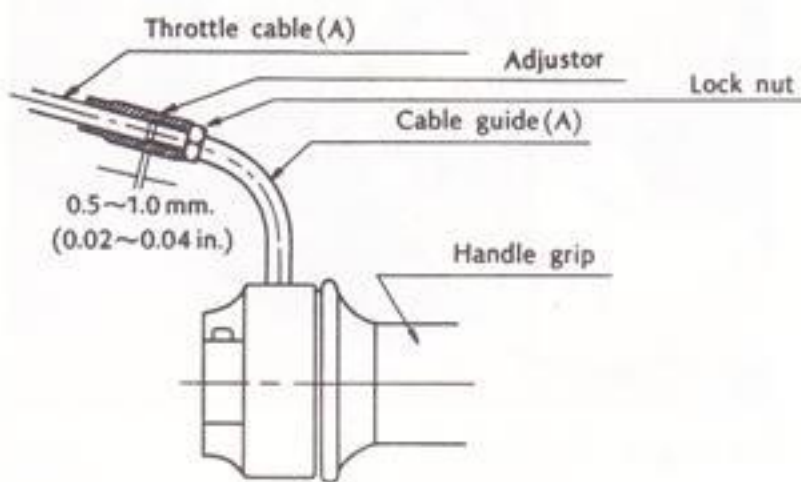


Fig 2-3-6

Pull the outer part of the throttle grip to check the play of throttle cable A. If the play is excessive or insufficient, adjust the free play with the adjustment screw.

b Auto lube Cable Adjustment

- 1) Adjust the pump cable so that the marking (arrow) on the Autolube pump adjustment pulley is aligned with the guide pin (see Figs. 2-3-7 & 8.)

Begin by fully closing the accelerator grip, then slowly turning it back again so that the slack in the throttle cable is completely taken up. Next, adjust the pump cable so that the marking on the pump adjustment pulley will be aligned with the guide pin, as shown in Fig. 2-3-7. The point of adjustment is at the end of the cable, just before it enters the case. Loosen the lock nut screw the the adjustor in or out, whichever direction is necessary to obtain the correct adjustment.

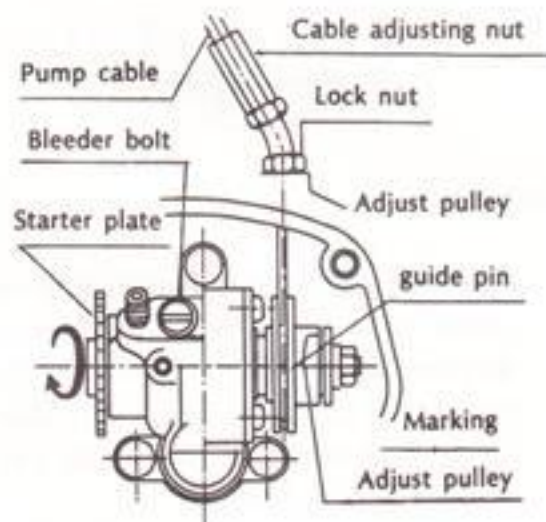


Fig 2-3-7

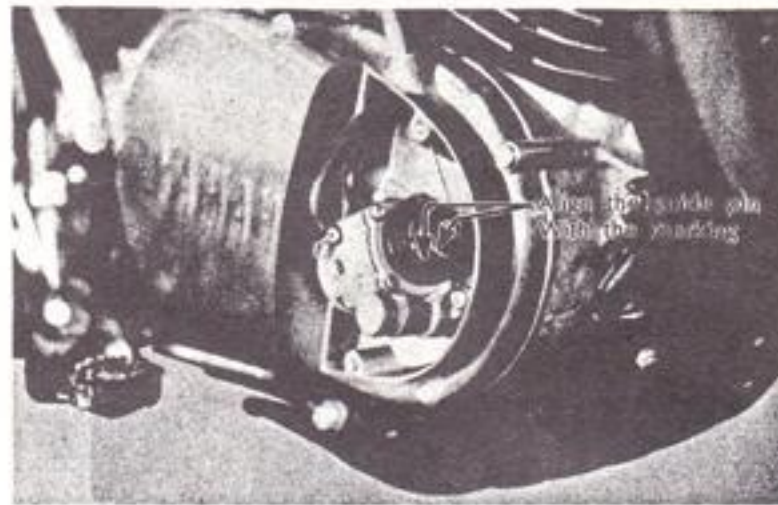


Fig 2-3-8

3 Bleeding

When the pump has been removed or the Auto-lube oil has run out, air will enter the pump. The air will cause an irregular flow of oil after the pump is mounted again or the oil is refilled. In order to prevent such an irregular flow of oil, bleed the pump in the following manner.

- 1) Remove the bleeder bolt.

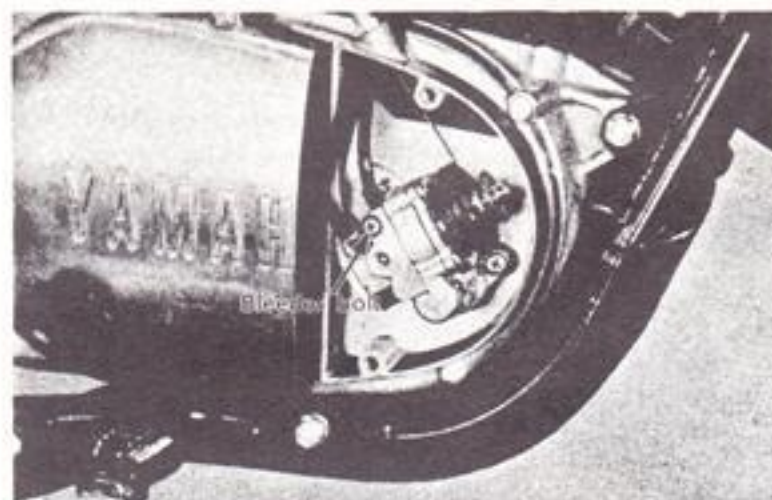


Fig 2-3-9

- 2) Next, rotate the starter plate in the direction of the arrow marked on the plate. Continue turning the plate until no air remains, and tighten the bleeder bolt. To facilitate this bleeding, fully open the accelerator grip and rotate the starter plate. As the plunger stroke becomes greater, the air can be quickly bled. (Fig 2-3-10)



Fig 2-3-10

CHAPTER 3 5-PORT CYLINDER INDUCTION SYSTEM

3-1 Construction and Features Design of the 5-port Induction System

The 2 additional transfer passages are placed to the immediate rear of the standard transfer ports. These two additional ports run from the bottom of the cylinder up to the same height as the standard transfer ports. These additional ports are designed to direct the fresh charge

at the area containing the remaining exhaust gases. As the fresh fuel charge enters the combustion area, the remaining exhaust gas is forced out the exhaust port leaving the combustion area with an uncontaminated full fresh fuel charge.

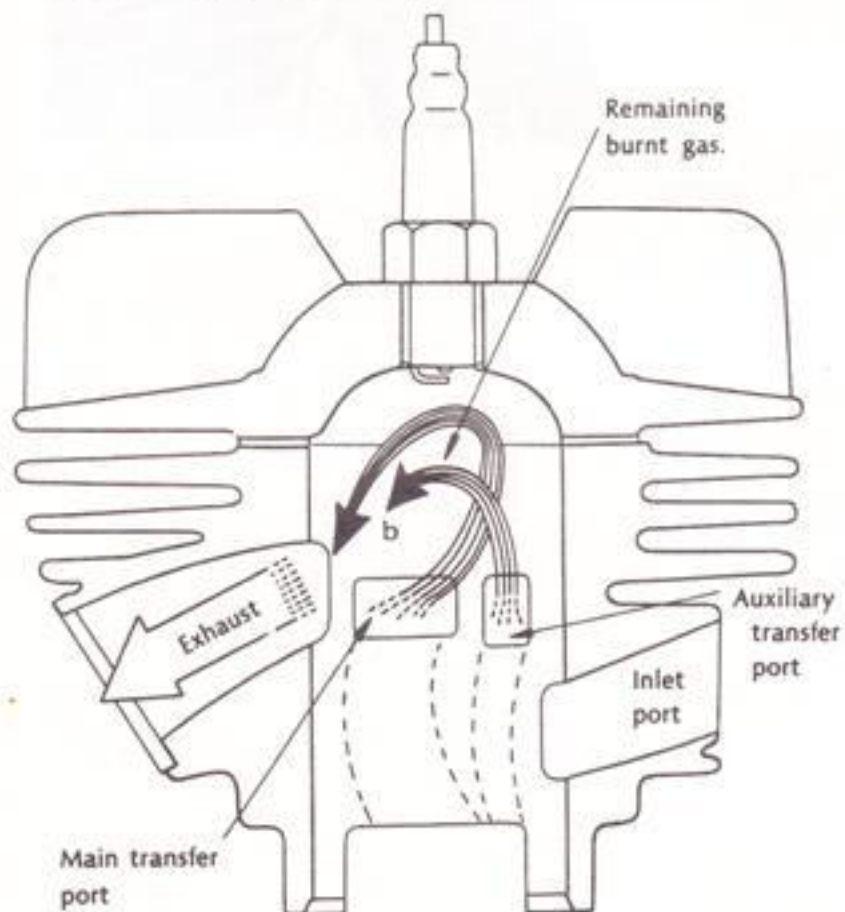


Fig 3-2-1

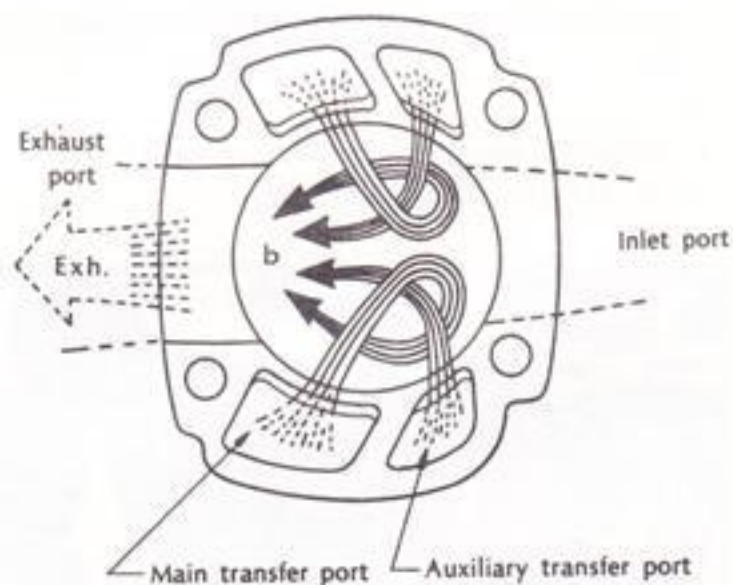


Fig 3-2-2

CHAPTER 4 ENGINE

The DT1-E 250cc Enduro engine has been designed with emphasis on both low speed trail riding and high speed road riding. The incorporation of the evenly spaced five-speed transmission and five-port induction system insure complete riding versatility for the owner. The width, height, and weight of the engine has been kept at a bare minimum to insure ease of handling in the roughest terrain.

Disassembly and assembly of the engine and its components should be done in the following manner and order. This will insure correct maintenance and service work for the owner and mechanic.

Preparation for disassembly of the engine :

- 1) All dirt, mud, dust, and foreign material should be thoroughly removed from the exterior of the engine assembly 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 installation of all engine parts.

4-1 Engine Removal

1. Start the engine and warm it up for a few minutes, then turn off the engine and drain the transmission oil.

Volume of oil 1,000c.c. (1.0qt.)
(Fig-4-1-1) (SAE10W/30)

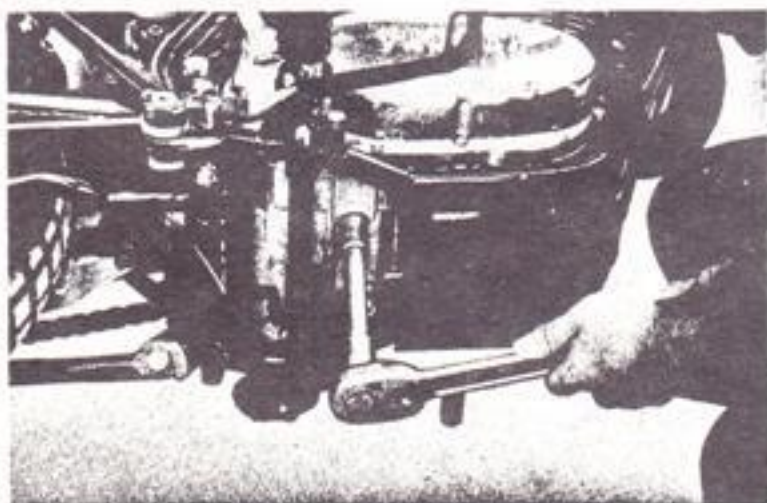


Fig. 4-1-1

2. Remove the muffler.
 - 1) Remove the two springs and two bolts.

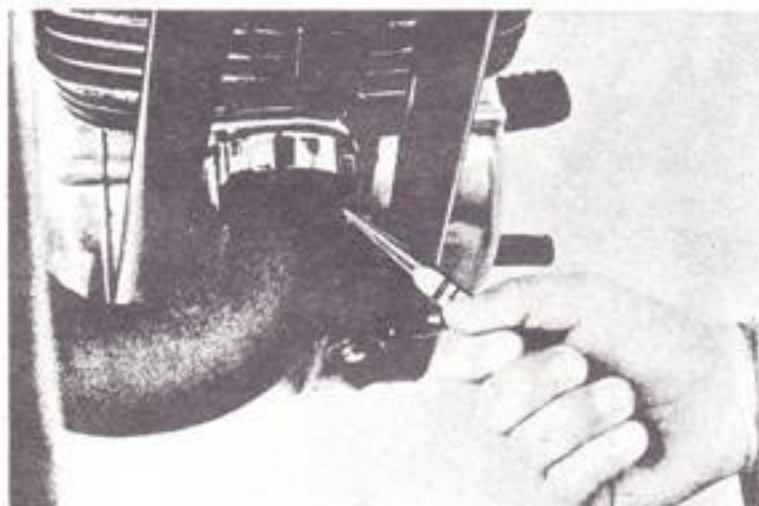


Fig 4-1-2

- 2) Remove the muffler holding bolts
(Figs. 4-1-3 and 4)



Fig 4-1-3

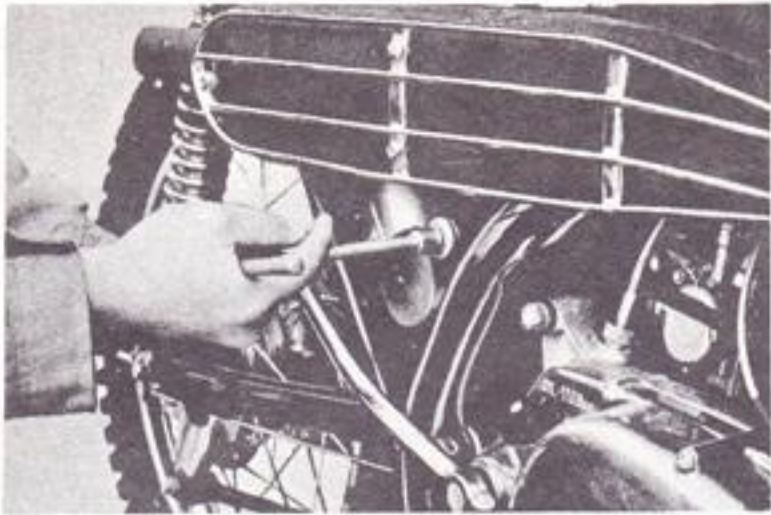


Fig 4-1-4

3 Remove the change pedal.

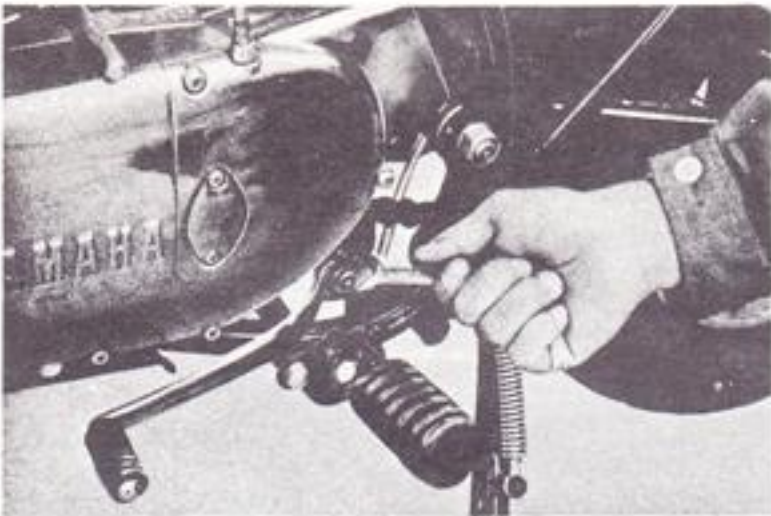


Fig 4-1-5

4 Remove the dynamo cover.

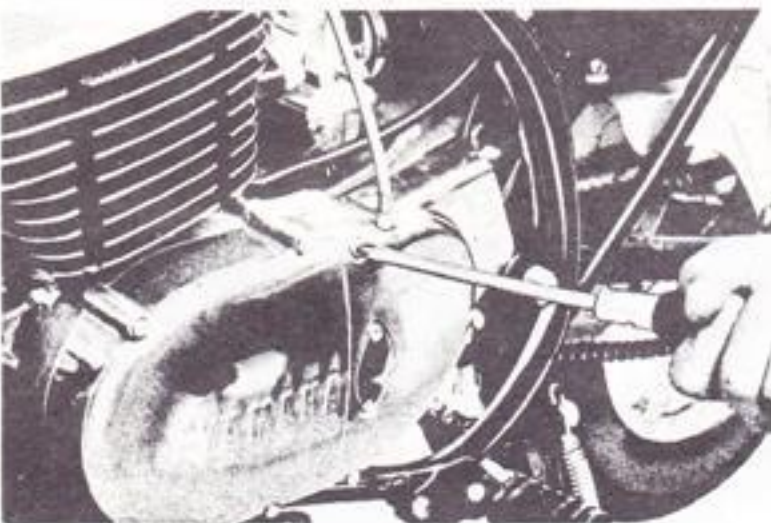


Fig 4-1-6

5 Disconnect the master link and remove the chain.

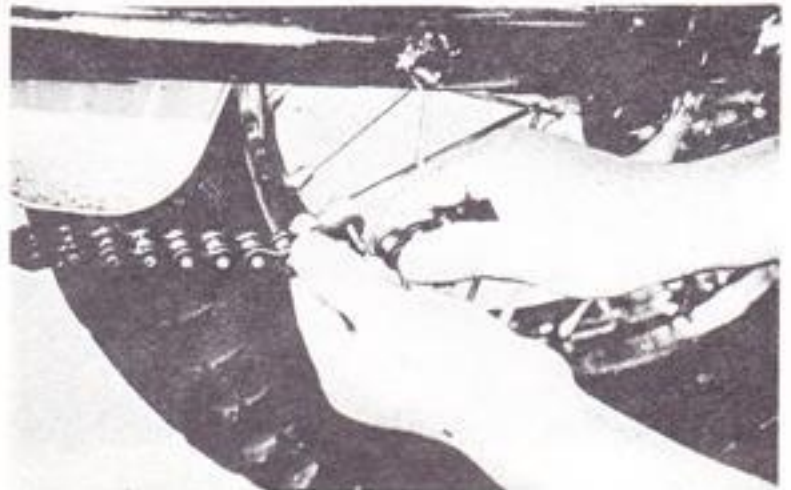


Fig 4-1-7

6 When replacing the chain, be sure the master link is facing in the correct direction.

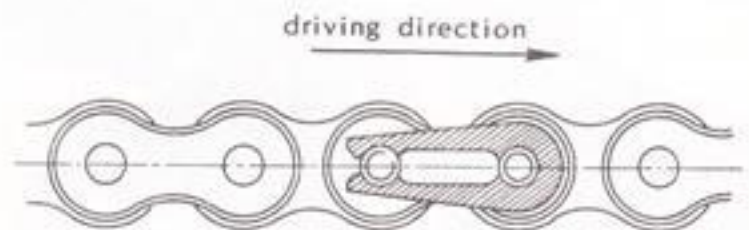


Fig 4-1-8

After replacing, adjust the chain free play to 25 mm (1 in.) up and down at the center of the lower section with the rear wheel on the ground, with the rider in position.

6 Remove the pump cover and pump cable.



Fig 4-1-9

7 Remove the tachometer cable.

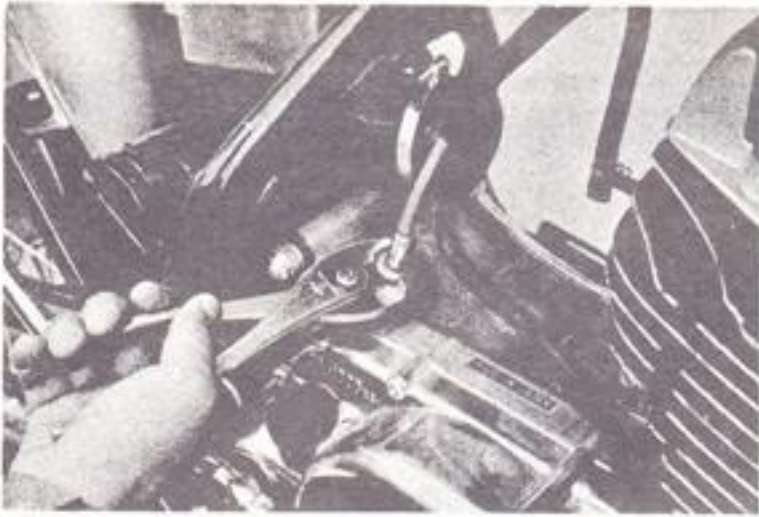


Fig 4-1-10

8 Remove the carburetor throttle valve.

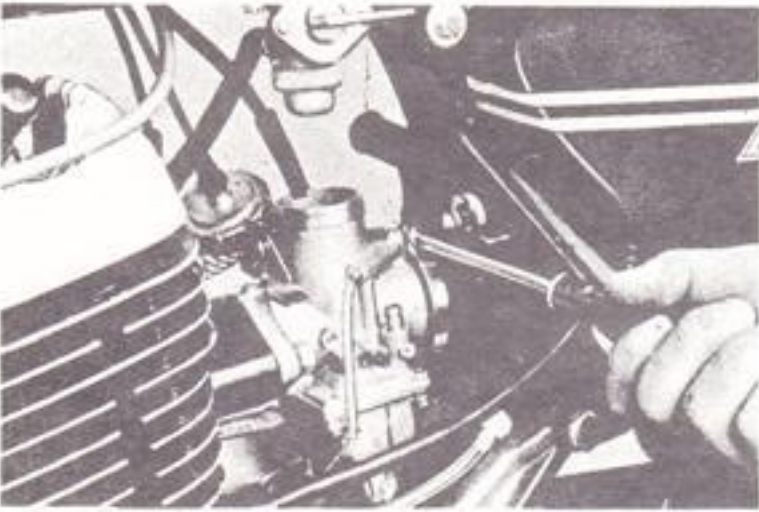


Fig 4-1-11

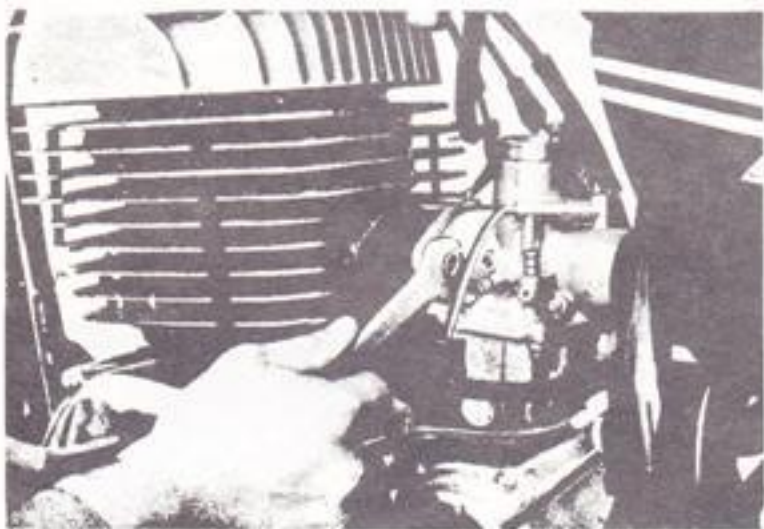


Fig 4-1-12

9 Disconnect the oil line and be sure to plug the hole to prevent oil from flowing out.



Fig 4-1-13

10 Disconnect the fuel line at the bottom of the fuel tank.

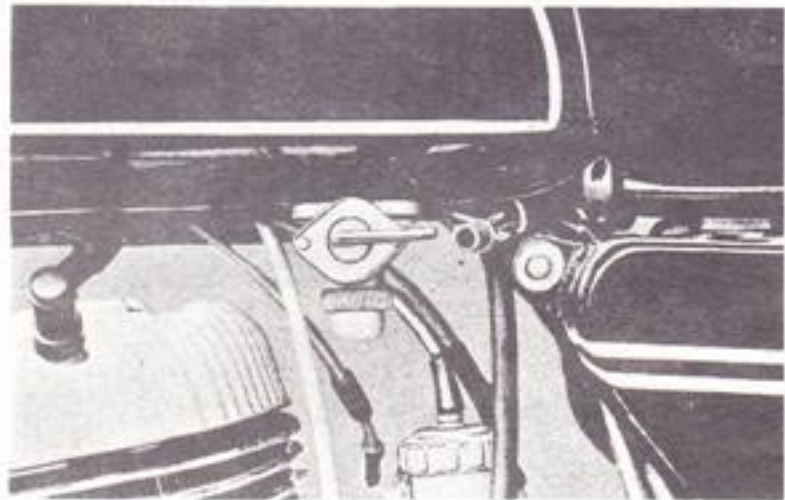


Fig 4-1-14

11 Remove the four engine mounting bolts.

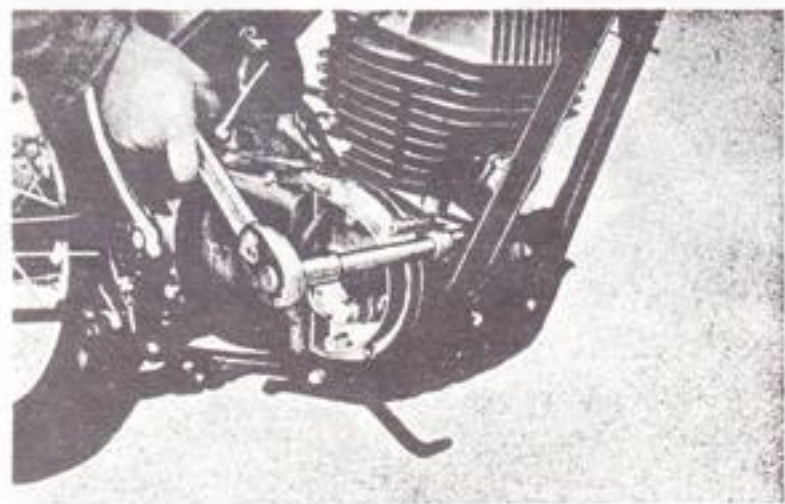


Fig 4-1-15

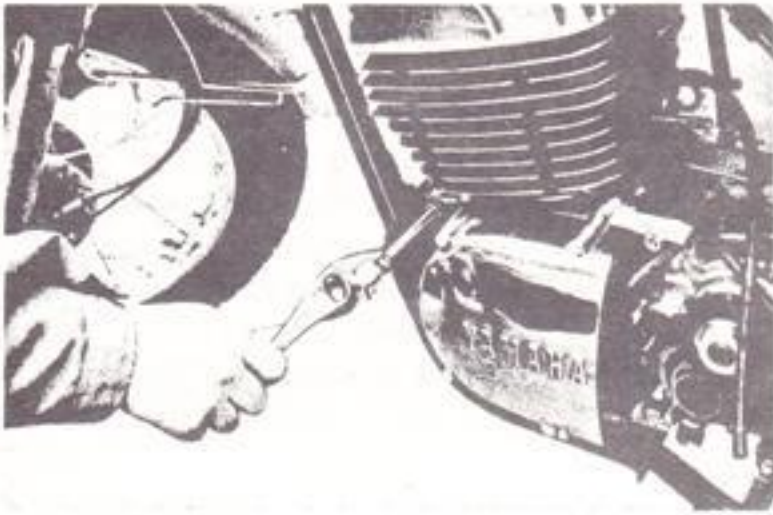


Fig 4-1-16

12 Remove the engine from the frame.

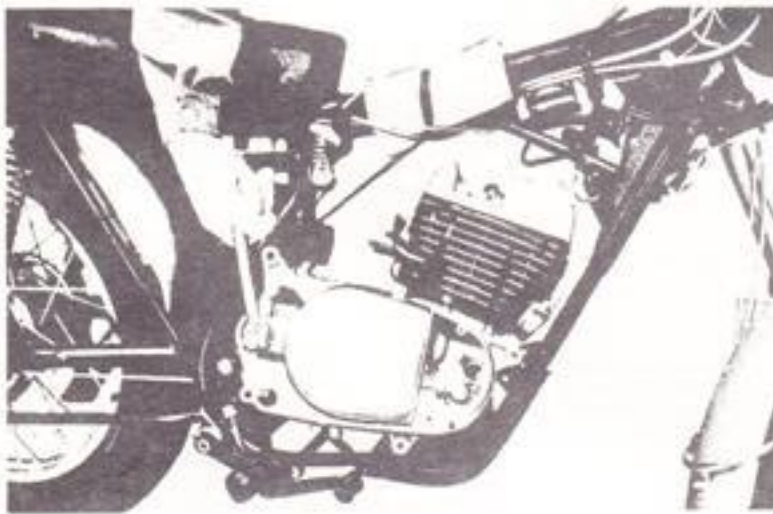


Fig 4-1-17

4-2 Cylinder Head

The cylinder head is bolted on the cylinder with special nuts.

1 Removing

Remove the four special nuts from the top of the cylinder head, and then the head and gasket. Reverse the sequence for reinstallation. Replace the gasket, if damaged.

Cylinder head tightening torque is 3.5 ~ 40kg-m. (25.3 ~ 28.9ft-lbs.)

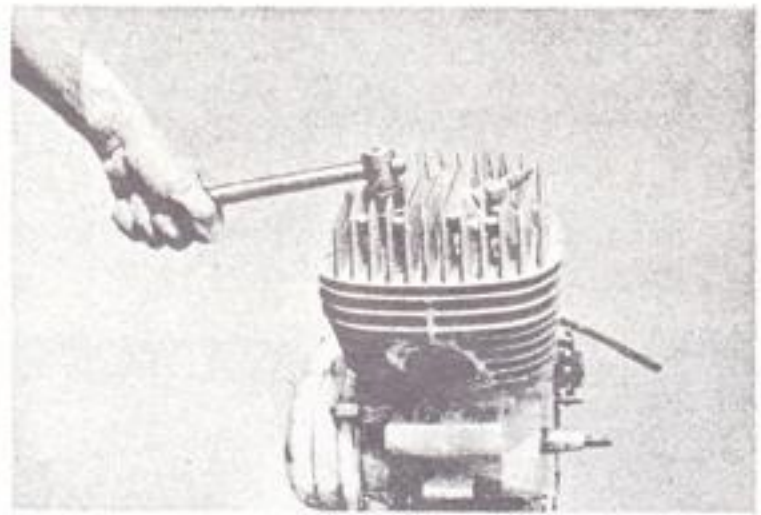


Fig 4-2-1



Fig 4-2-2

2 Removing Carbon Deposits

Carbon deposits on the combustion chamber dome and piston crown will result in an increase in the compression ratio, as well as preignition and engine overheating.

Scrape the dome and piston crown clean.

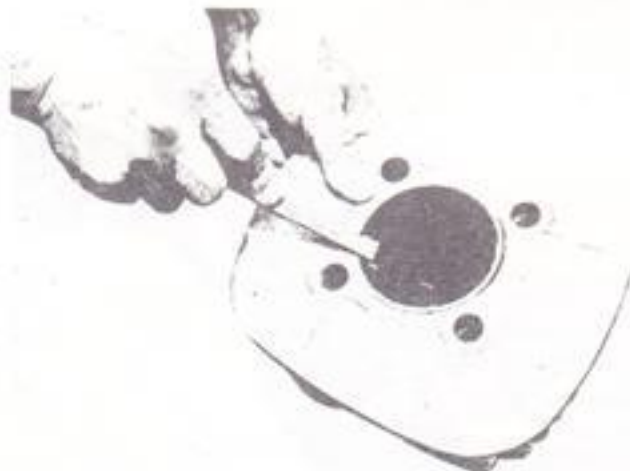


Fig. 4-2-3

4-3 Cylinder

1 Removing the Cylinder

- 1) Remove the oil delivery line banjo bolt from cylinder.

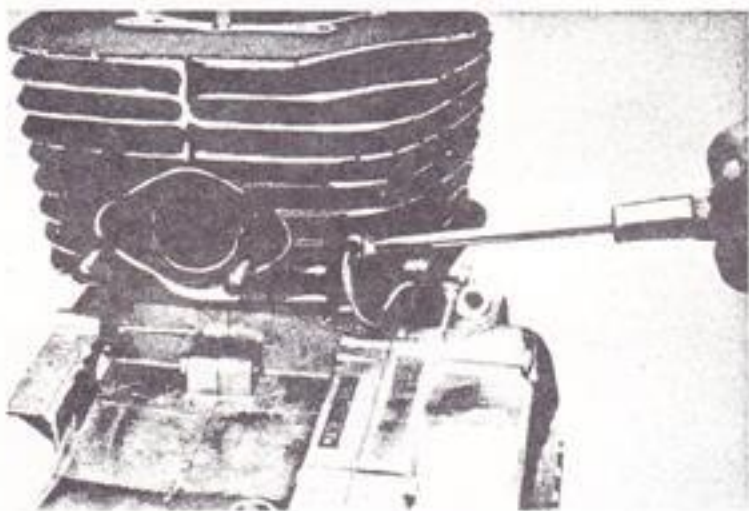


Fig 4-3-1

- 2) Remove the cylinder by striking it lightly with a plastic or rubber hammer.

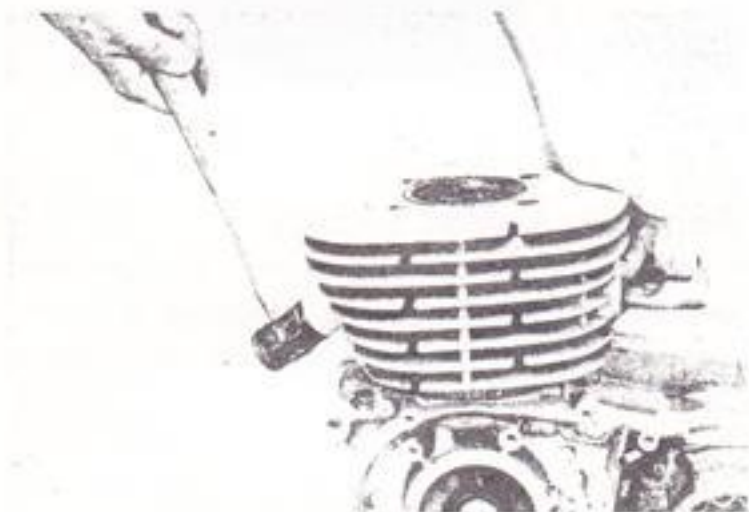


Fig 4-3-2

- 3) Always replace the cylinder base gasket when reassembling cylinder.

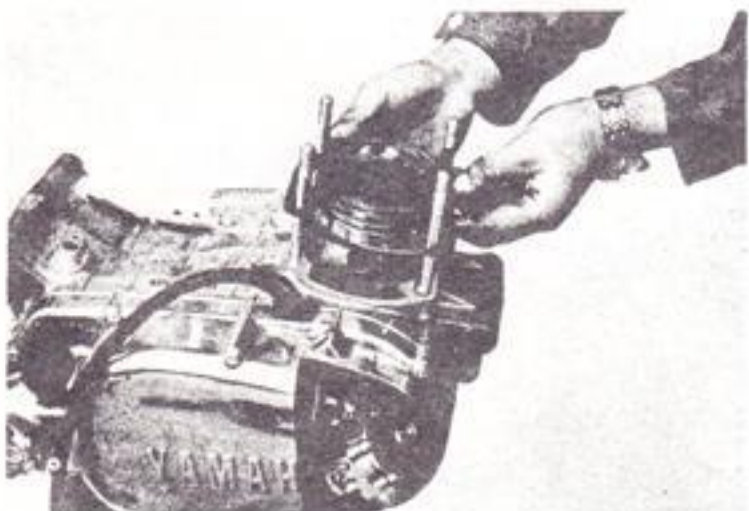


Fig 4-3-3

2 Checking the Cylinder for Wear

- 1) Measure the amount of cylinder wall wear with a cylinder bore measuring micrometer or cylinder gauge. (Measure it at four depths by positioning the instrument at right angles to the crankshaft.) If the difference between the maximum and minimum diameter exceeds 0.05mm (0.0019") re-bore and hone the cylinder.

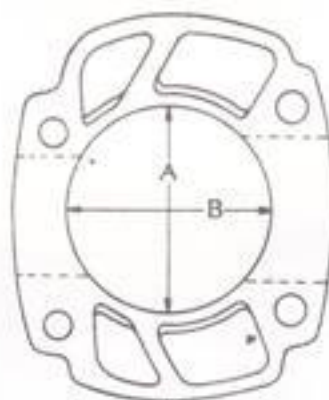


Fig 4-3-4

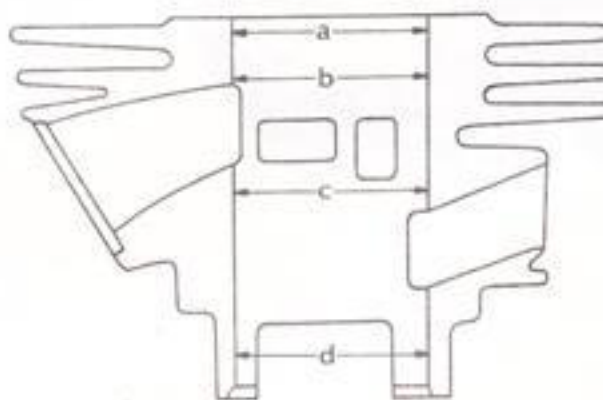


Fig 4-3-5

- 2) The minimum clearance between the piston and the cylinder is 0.040-0.045mm. (0.0016" to 0.0018")

3 Cylinder Reconditioning

- 1) Pistons are available in 0.25 and 0.50 mm. (0.010" and 0.020") oversizes.
- 2) Cylinder should be rebored and honed to the diameter of the oversize piston plus the minimum allowable clearance. (5-3-2)
- 3) The error between the maximum and minimum diameters after honing should be no more than 0.04mm (0.0015")

4. Removing Carbon Deposits

Scrape off the carbon accumulation in the exhaust port of the cylinder with a hacksaw blade dulled at one end.



Fig 4-3-6

5 Installing the Cylinder

Put your fingers at each end of the piston ring, expand the ring, and slip it onto the piston. Align both ends of the ring with the knock pin in each ring groove. Then insert the piston into the cylinder. Take care not to damage the bottom of the cylinder with the rings.

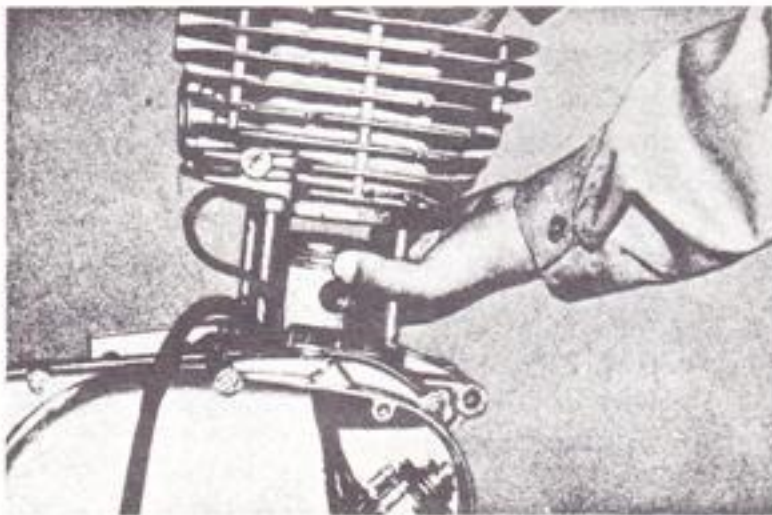


Fig 4-3-7

4-4 Piston Pin

1 Pulling out the Piston Pin

Remove the clips at ends of the piston pin both with needle nose pliers, and press out the piston pin with a finger or a slot-head screwdriver.

Note: Before removing the piston pin clips, cover the crankcase with a clean rag, so you will not accidentally drop the clip or other foreign particles into the crankcase.



Fig 4-4-1

2 Piston-to-Piston Pin Fit

The piston pin should fit snugly in its bore so that it drags a little as you turn it. If the pin is loose, replace the pin and/or the piston.

If the pin has step-wear in its center, replace the needle bearing as well as the piston pin. Check the small end of the connecting rod for wear by inserting the piston pin and bearing.



Fig 4-4-2

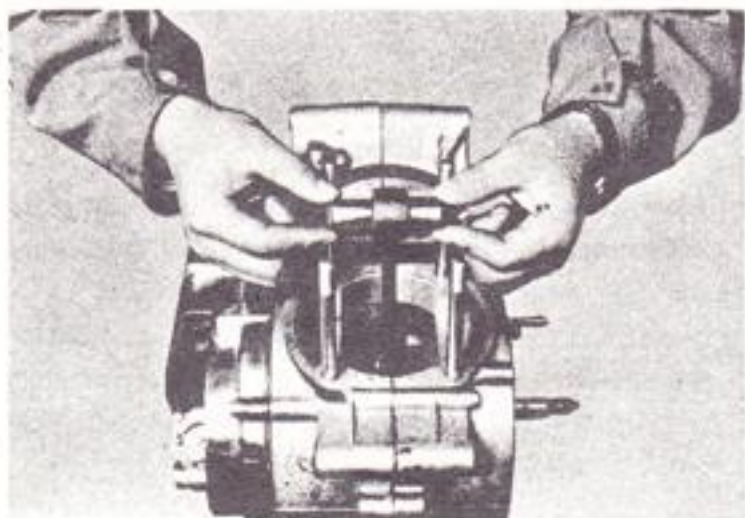


Fig 4-4-3

4-5 Piston Ring

1 Removing the Piston Rings

Put your thumbs at each end of the piston ring and pull the piston ring ends apart. Remove the ring by moving the ring off the piston on the other side of the ring ends.



Fig 4-5-1

2 Installing the Piston Ring

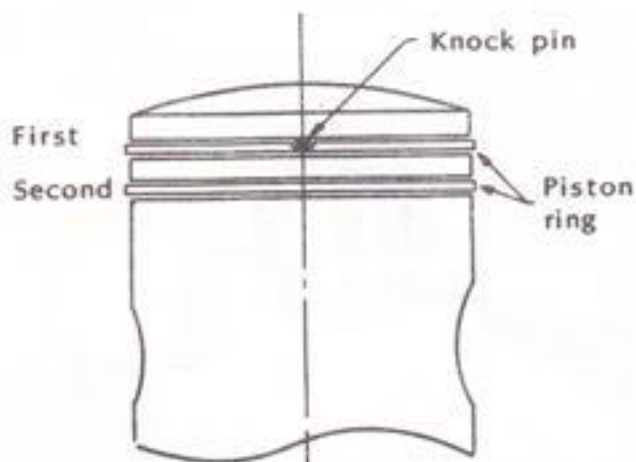


Fig 4-5-2

First fit the No.2 ring over the piston, and then the No.1 ring, and align their end gaps with the locating pin in each ring groove. (Fig. 4-5-2)
The printing on all rings must face up to position the gap properly at the pin.

3 Checking the Piston Rings

- 1) Measuring piston ring wear
Put the ring into the cylinder so that the ring is parallel to the cylinder bottom edge, and then measure the end gap with a feeler gauge. (Fig. 4-5-4)



Fig 4-5-3

The end gap should be between 0.2 and 0.4 mm. (0.008-0.015 in.) for both No.1 and No.2 rings. (0.4-0.5 mm. (0.016-0.019 in.) with GYT kit)

- 2) Removing carbon
Carbon on the piston rings and in the ring in grooves will make the rings stick in the piston, thus causing gas blow-by. Remove the rings from the piston, and clean the carbon from the rings and ring grooves.

4-6 Piston

The piston is made of a high-silicon aluminum alloy

1. Checking and Correcting the Piston to Cylinder Wall Clearance

- 1) Measuring piston clearance
Piston clearance is the difference between the minimum cylinder bore diameter and the maximum outside diameter of the piston.

As described in 4-3, Cylinder, piston clearance should be 0.040-0.045 mm. (0.0016-0.0018 in.)

To determine the maximum piston diameter, measure the piston with a micrometer at right angles to the skirt 10 mm. (3/8 in.) from its bottom edge. (Fig. 4-6-1)



Fig 4-6-1

2) Checking and correcting scratches on the piston

A piston showing signs of seizure will result in noise and loss of engine power. It will also cause damage to the cylinder wall.

If a piston that has seized is used again without correction, another seizure will develop at the same area. Lightly sand the seizure "high spot" on the piston with #400 sandpaper until smooth. (Fig. 4-6-2)



Fig 4-6-2

3) Removing Carbon

Remove carbon accumulations on the piston head with screwdriver or a saw-blade. (Fig. 4-6-3)

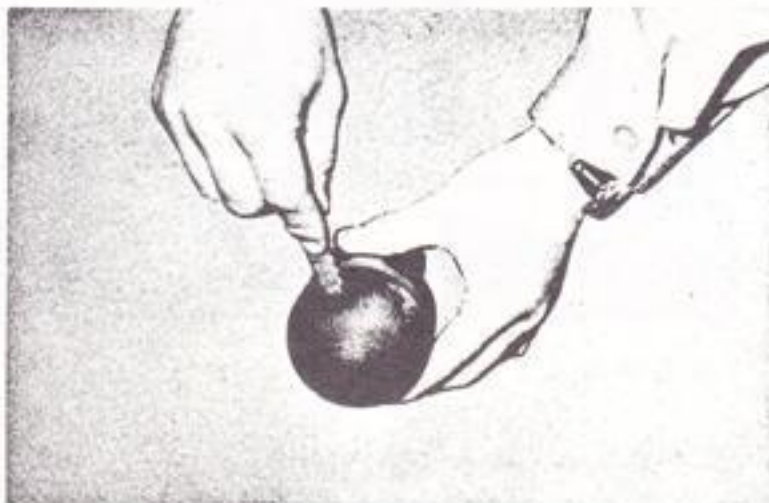


Fig 4-6-3

Carbon and gum accumulations in the piston groove will result in piston ring seizure. Remove all carbon from the ring groove. (Fig. 4-6-4)



Fig 4-6-4

2 Piston Installation Direction

Install the piston with the arrow mark on the head pointing forward (toward the exhaust port of the cylinder)

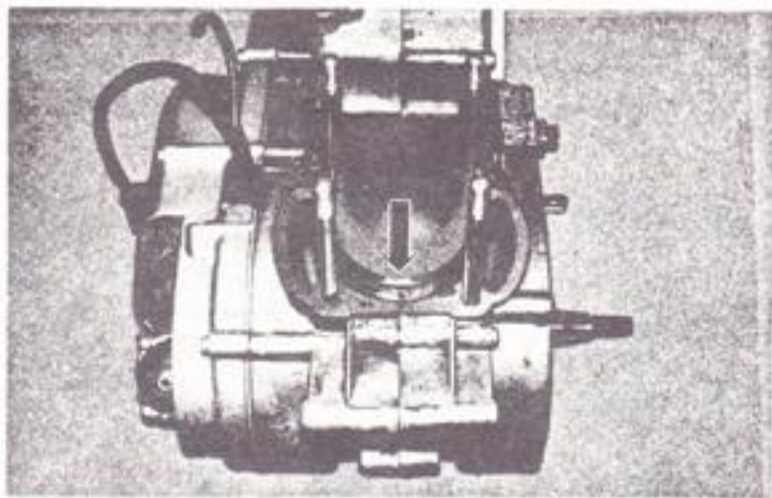


Fig 4-6-5

4-7 Flywheel Magneto

- 1 Remove the dynamo cover

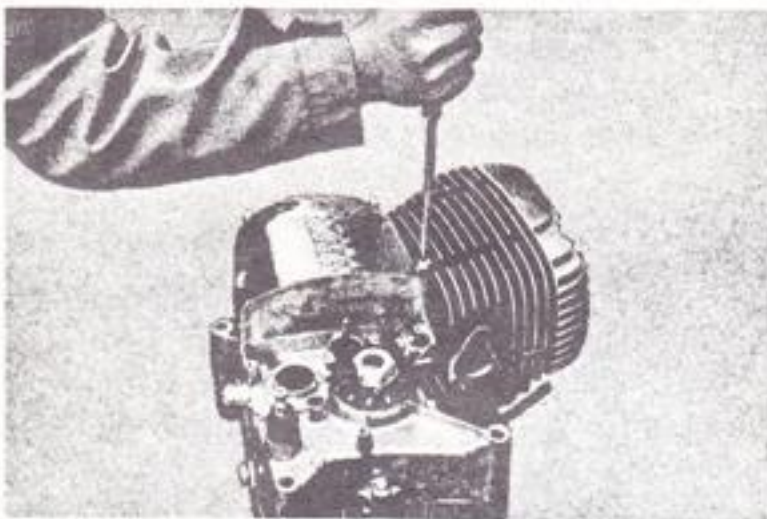


Fig 4-7-1

- 2 Remove the nut using a flywheel magneto holding tool.

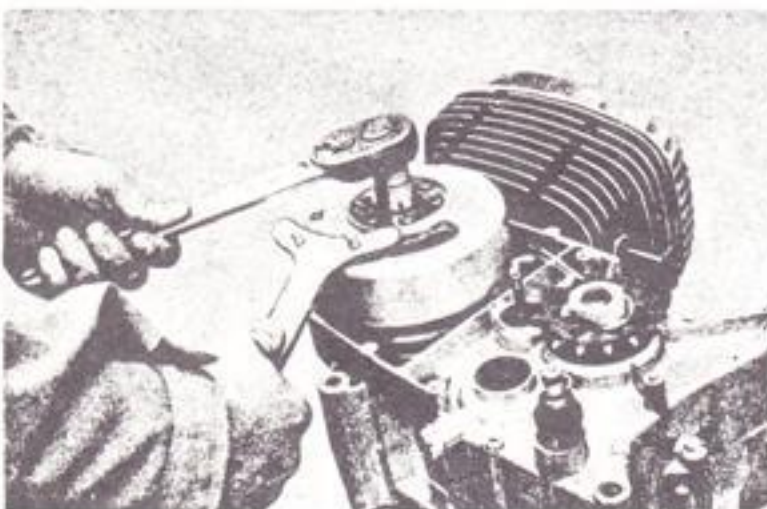


Fig 4-7-2

- 3 Install the flywheel magneto puller.
(It has a left-head thread)
After the puller is secure, tighten the push screw and the flywheel will break loose.

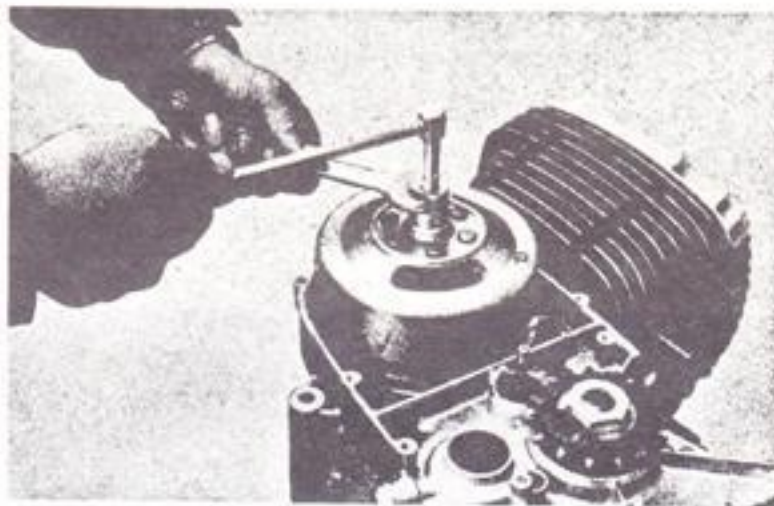


Fig 4-7-3

- 4 Remove the three screws holding the flywheel magneto base to the crankcase, and remove the flywheel magneto base.

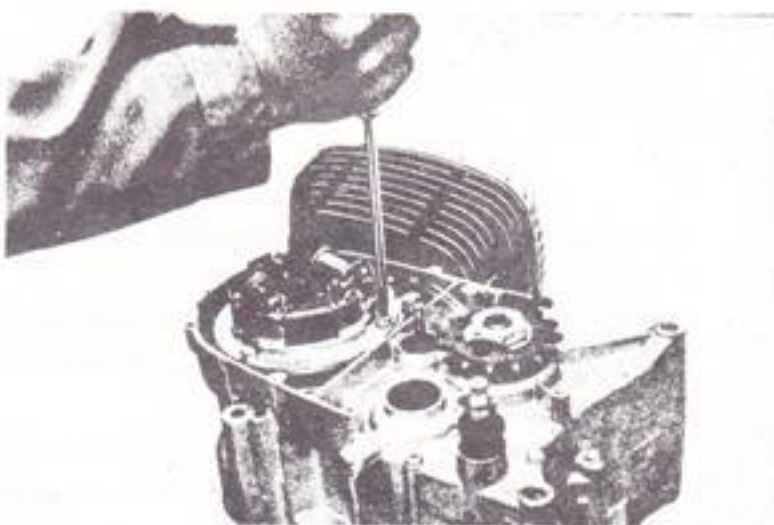


Fig 4-7-4

- 5 Remove the woodruff key.
It is advisable to place the woodruff key on the flywheel magnets (using its magnetic force) while the key is removed for engine service.

4-8 Crankcase Cover (R. H.)

1 Removal

- 1) Remove the kick crank mounting bolt and the crank.

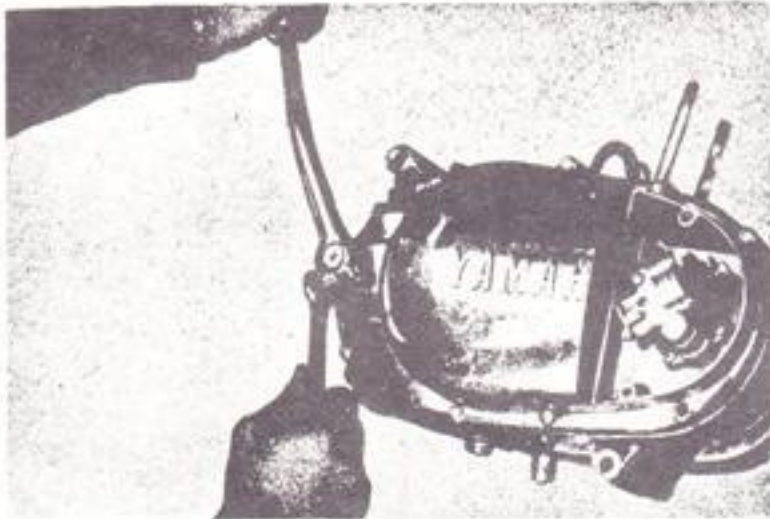


Fig 4-8-1

- 2) Remove the pan head screws holding the crankcase cover, and then remove the case cover. (The cover can be removed without taking off the oil pump.)



Fig 4-8-2

- 3) Remove the crankcase cover gasket and replace it, if damaged.



Fig 4-8-3

2 Installation

Spread YAMAHA Bond No.5 over the mating surface of the right-hand crankcase. Place the crankcase cover gasket on the crankcase, apply Yamaha Bond No.5 and install the right-hand crankcase cover. Be sure to apply YAMAHA Bond No.5 to the mating surface; otherwise, the crankcase will leak.

Note:

When installing the crankcase cover (R) make sure that the pump drive gear (made from synthetic resin) is correctly engaged with the primary drive gear.



Fig 4-8-4

4-9 Clutch

The clutch is a wet, multi-disc type, consisting of six molded cork friction plates and seven clutch plates in the clutch housing mounted on the transmission main axle. To disengage the clutch, an inner push rod system is employed. The primary driven gear coupled with the clutch housing is meshed with a kick pinion gear allowing

starting by kicking the starter with the clutch disengaged or engaged. A shock absorber consisting of coil springs is between the primary driven gear and the clutch housing.

The primary drive gear has 21 teeth, and the primary driven gear 65 teeth.

(Primary reduction ratio..... $65/21 = 3.095$)

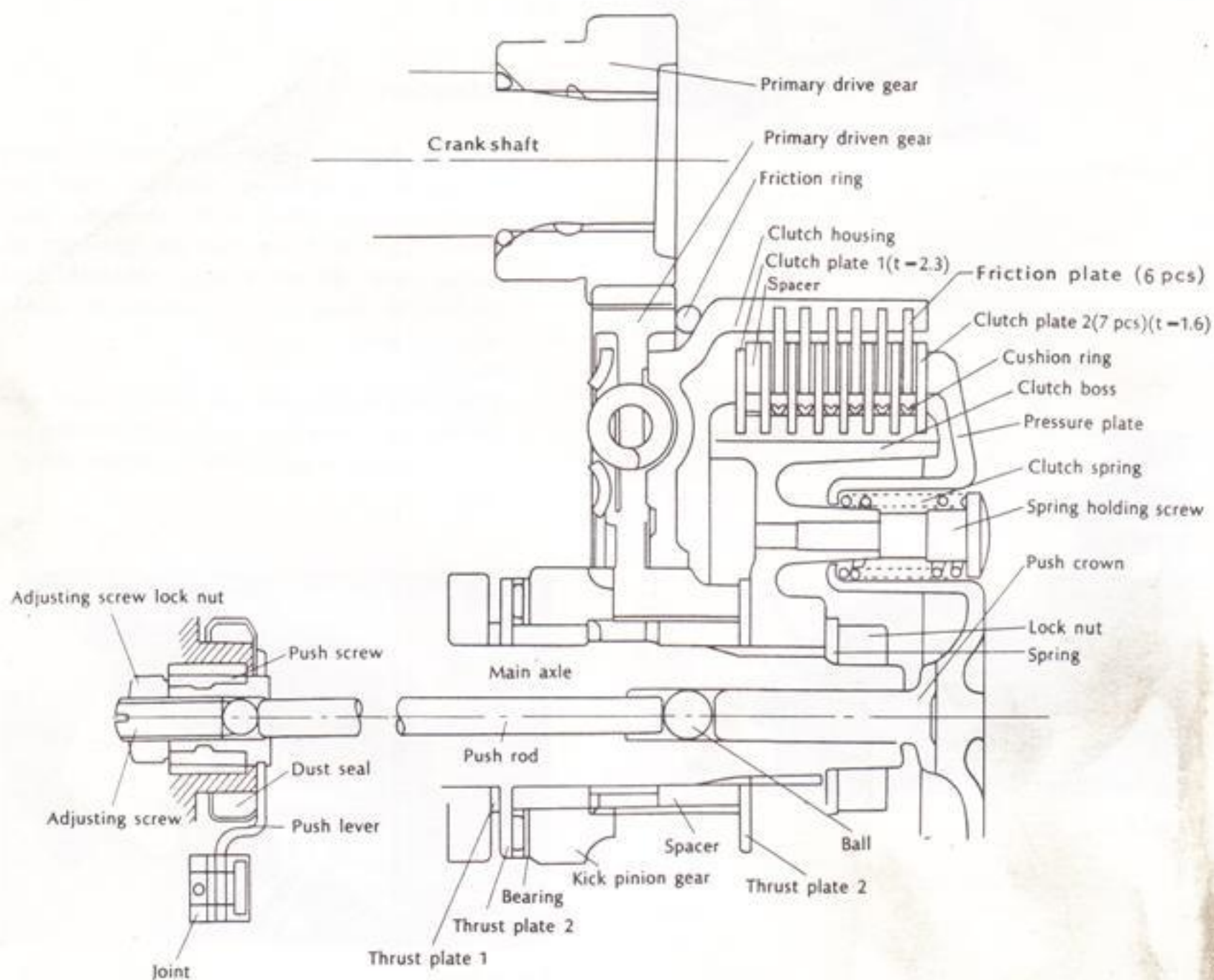
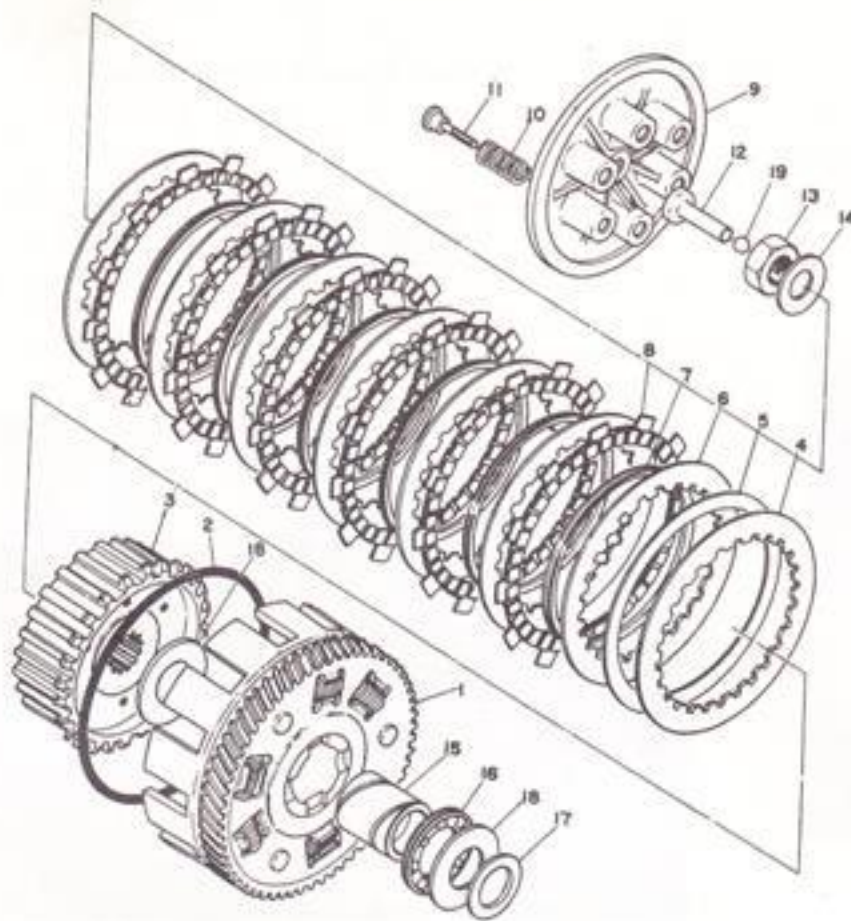


Fig 4-9-1



1. Primary driven gear complete
2. O-ring (Friction ring)
3. Clutch boss
4. Clutch plate 1
5. Spacer
6. Clutch plate 2
7. Cushion ring
8. Friction plate
9. Pressure plate
10. Clutch spring
11. Spring holding screw
12. Push crown
13. Lock nut
14. Spring
15. Spacer
16. Thrust bearing
17. Thrust plate 2
18. Thrust plate 1
19. Ball

Fig 4-9-2 Clutch assy exploded view

1 Removing the Pressure Plate

Remove the six clutch spring holding screws, and take out the pressure plate and push crown.



Fig 4-9-3

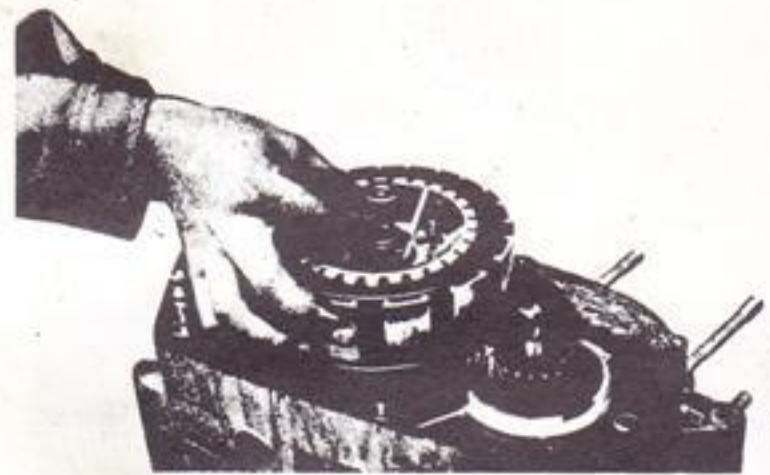


Fig 4-9-4

2 Removing the Clutch Boss

Install the clutch holding tool (same as R5, YDS5, YM2) on the clutch boss. Loosen the lock nut, and then remove the clutch boss.

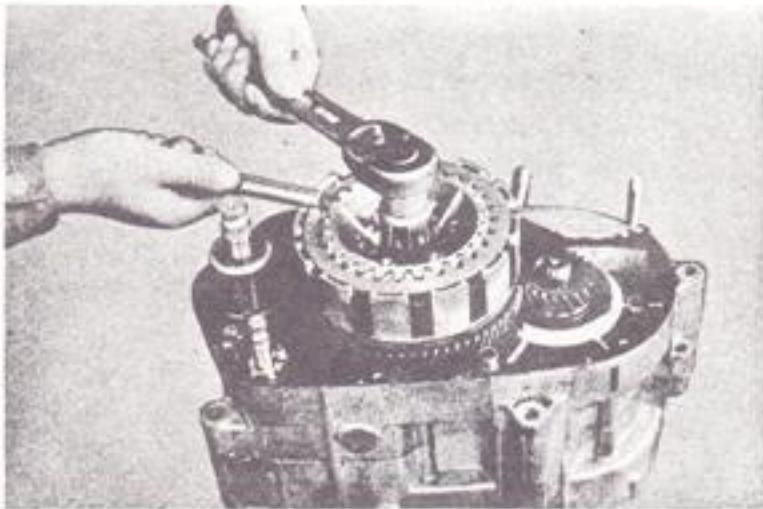
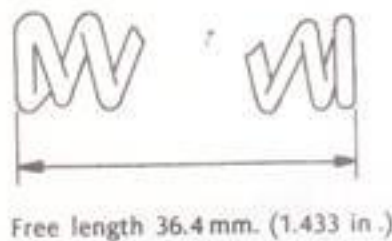


Fig 4-9-5

3 Checking the Clutch Spring

If the free length of the spring is 1 mm. (0.04 in.) or more shorter than the standard free length, replace it.



Free length 36.4 mm. (1.433 in.)

Fig 4-9-6

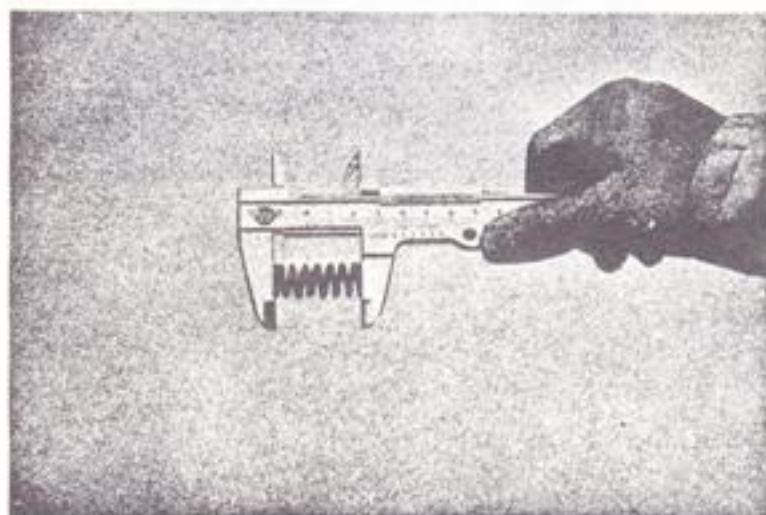


Fig 4-9-7

4 Check the Friction Plates

Inspect the friction plates for wear. Replace them if wear equals 0.3mm. (0.012 in.) or more.

Standard thickness 3.0 mm. (0.118 in.)

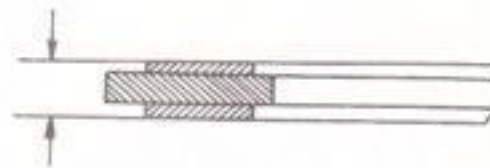


Fig 4-9-8

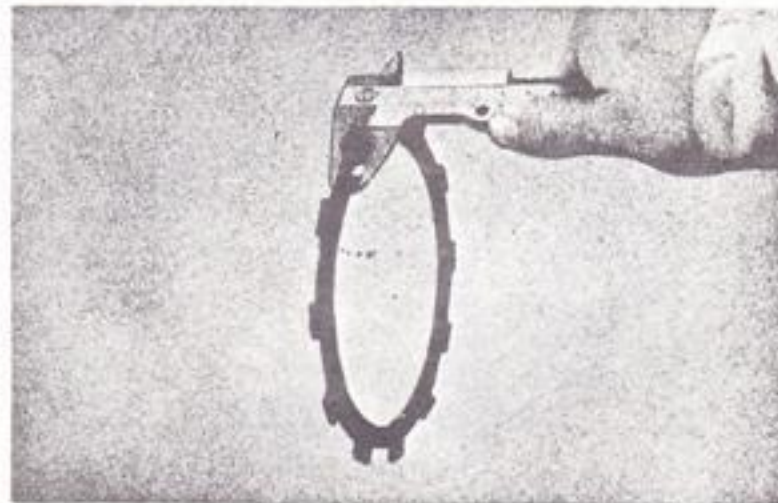


Fig 4-9-9

5 Clutch Housing Assembly (integrated with the primary driven gear).

A rubber friction ring is placed on the outside of the clutch between the primary driven gear and the clutch housing in order to reduce gear noise at low engine speeds.

1) Inspection

Insert the primary gear retaining collar (spacer) in the primary driven gear boss and check it for radial play.

If any scratches are found, replace it so it will not impair clutch action.



Fig 4-9-10

If the play is excessive (allowable clearance is between 0.009~0.048 mm.) replace the gear retaining collar because it will cause excessive noise.

6 Checking the Primary Gear Retaining Collar (Spacer)

Place the primary gear retaining collar around the main axle and again check it for radial play. If play exists (allowable clearance is between 0.020~0.062 mm.) replace the gear retaining collar. Replace any collar with step-wear on its outer surface.

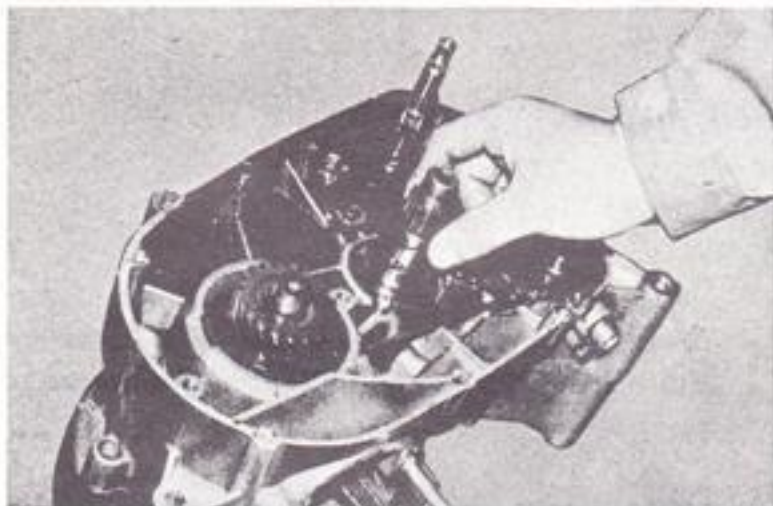


Fig 4-9-11

7 Fitting Cushion Rings

A cushion ring is installed between each of the clutch plates and the friction plates to insure even engagement and complete disengagement of the plates. When fitting cushion rings, be sure they are flat and not twisted.



Fig 4-9-12

8 Checking the Push Rod

Remove the push rod and roll it over a surface plate. If the rod is bent, straighten or replace it.

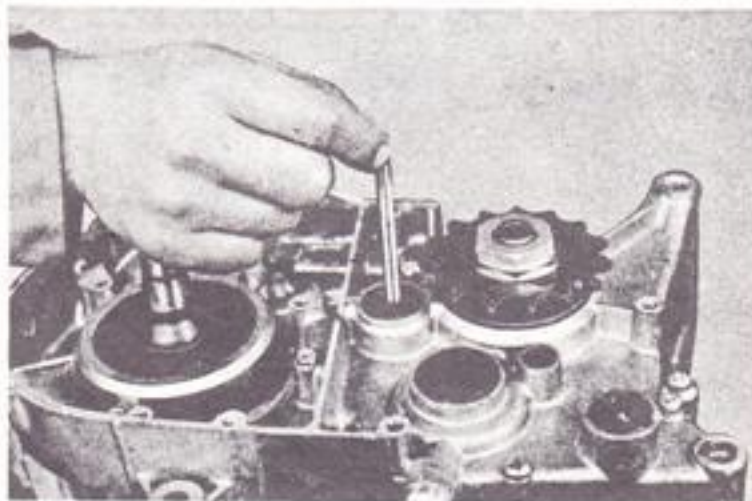


Fig 4-9-13

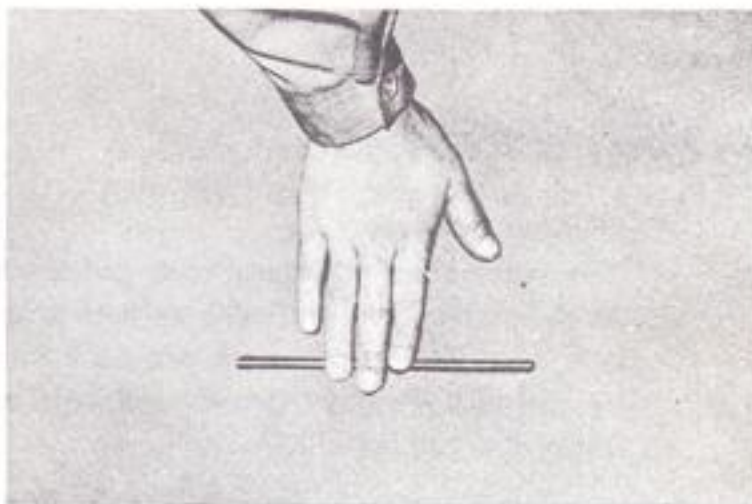


Fig 4-9-14

9 Caution on Re-assembling the Clutch

On both ends of the primary gear spacer are thrust washers and thrust bearings. If these washers and bearings are incorrectly installed, or omitted, the clutch boss will rub against the primary driven gear, impairing clutch action. The thrust bearing assembly fits on the primary retaining collar, but it may slip out of place when installing clutch boss.

Therefore, apply grease to both surfaces of the bearing to make it stick to the gear retaining collar.

Before fitting the clutch boss, install the clutch plates, friction plates, etc., and then install the clutch boss.

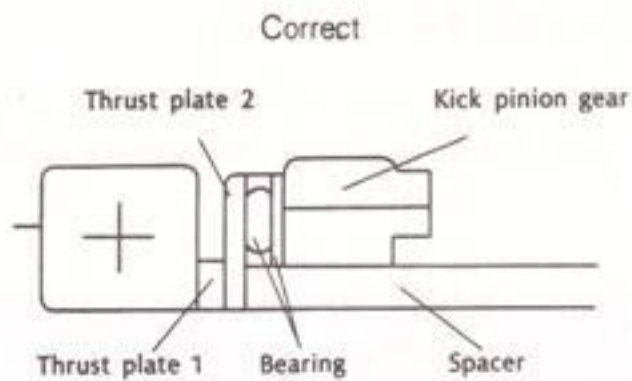


Fig 4-9-15

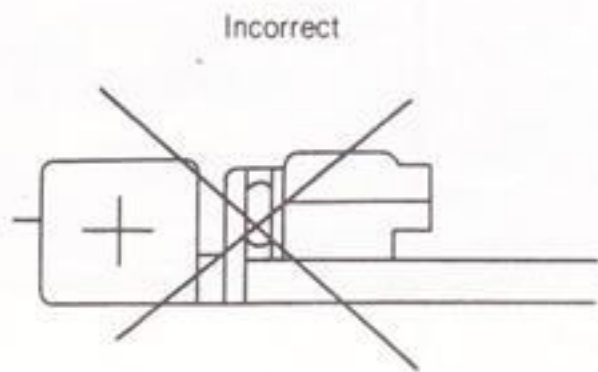


Fig 4-9-6

10 Adjusting the Clutch

1) Adjusting the Push Screw

Remove the clutch adjustment cover and loosen the push screw lock nut. Rotate the push screw in to a lightly seated position, and back it off 1/4 turn to get the proper spacing. The tighten the lock nut.

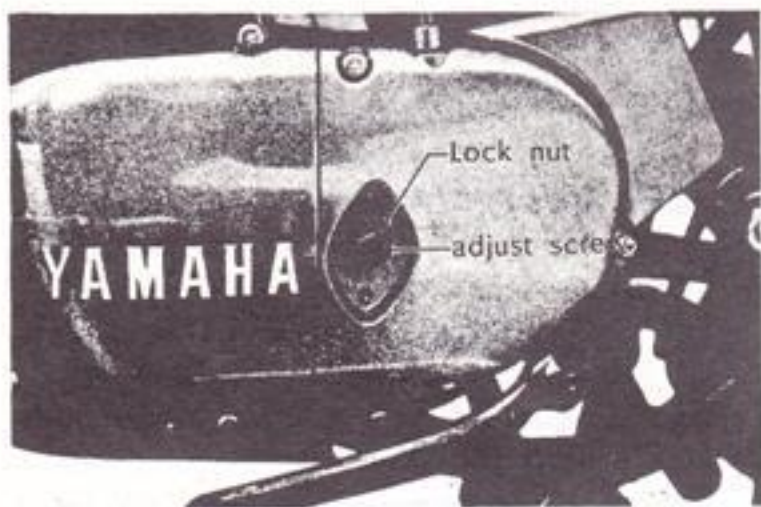


Fig 4-9-17

2) Adjusting the Clutch Cable Tension

The clutch cable becomes slackend after, being

used for a long time. Occasionally the cable must be adjusted so that the play of the clutch handle is from 2 to 3 mm. (1/16-1/8 in.)

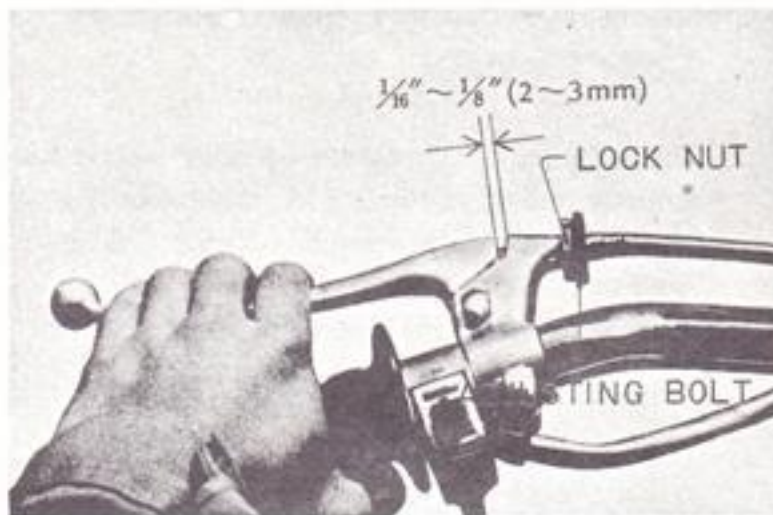


Fig 4-9-18

4-10 Primary Drive Gear

A Removal

Feed a rolled-up rag between the teeth of the primary drive gear and the primary driven gear to lock them, and then loosen the primary drive gear lock nut.

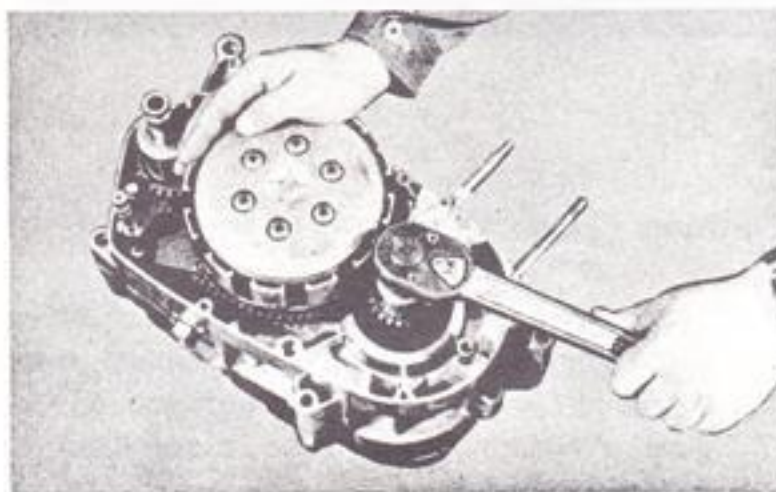


Fig 4-10-1

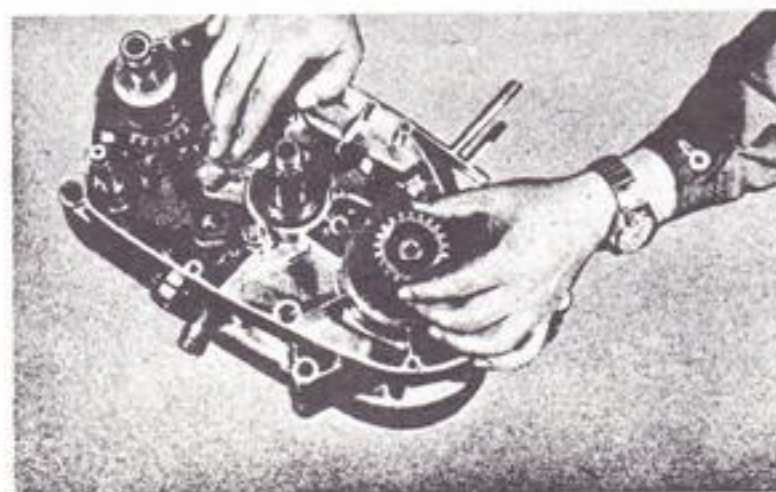


Fig 4-10-2

4-11 Kick Starter Mechanism

The kickstarter employs the primary kick system. To start the engine, you just kick the starter with the clutch disengaged or engaged. The ability to start the engine with the clutch disengaged can be a great advantage when racing. The kick gear is driven the same as the YR1. When the kick shaft rotates, the ratchet wheel is dis-

engaged from the ratchet wheel guide and meshes with the kick gear. The rotation of the kick gear is transmitted through the idler gear to the kick pinion that is engaged with the primary driven gear.

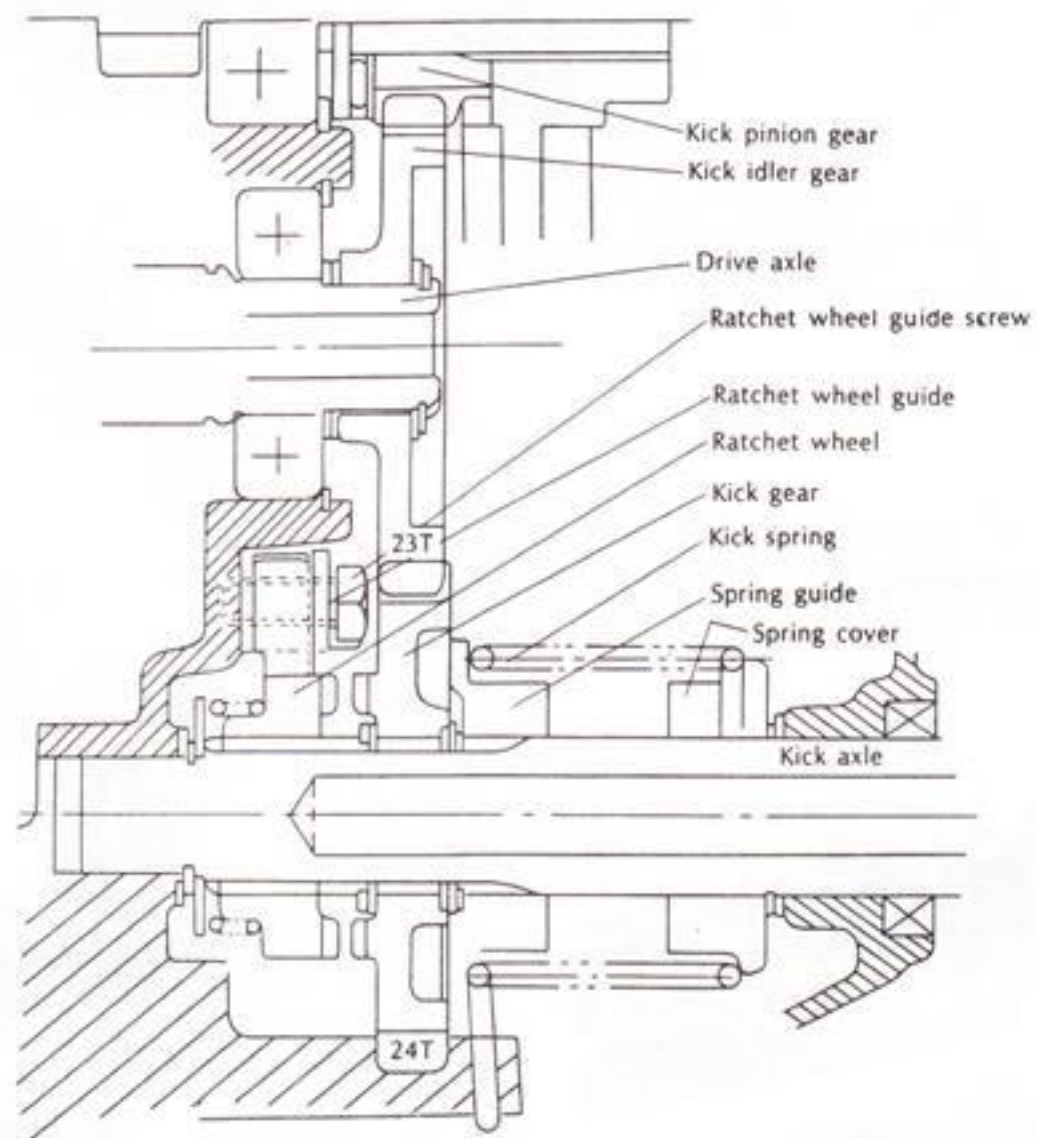
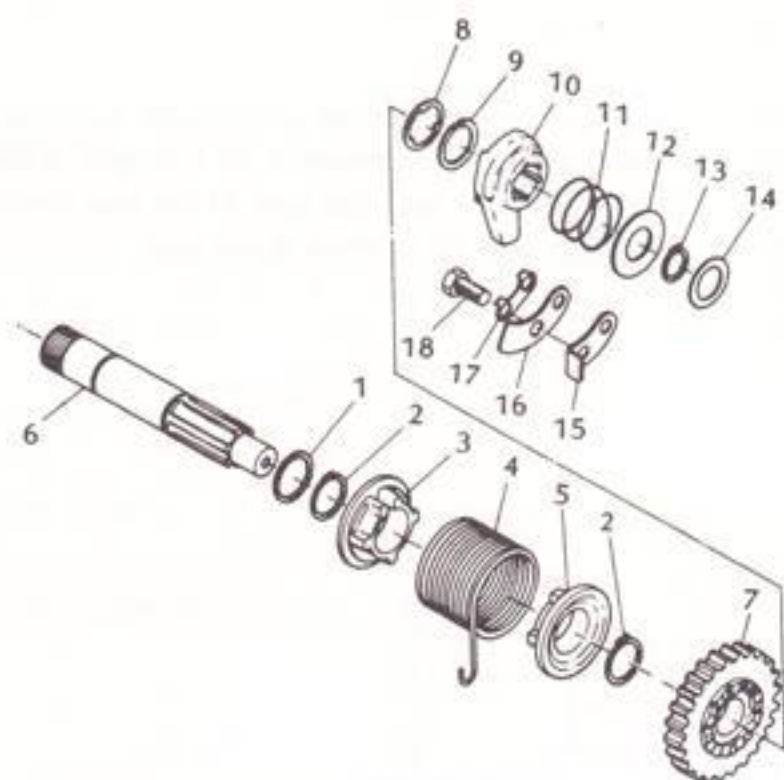


Fig 4-11-1



1. Shim 2
2. Circlip
3. Spring cover
4. Kick spring
5. Spring guide
6. Kick axle
7. Kick gear
8. Washer
9. Clip
10. Ratchet wheel
11. Ratchet wheel spring
12. Spring cover
13. Circlip
14. Shim 1
15. Stopper
16. Ratchet wheel guide
17. Lock washer
18. Ratchet wheel guide screw

Fig 4-11-2

1 Removal

1) Remove the kick spring

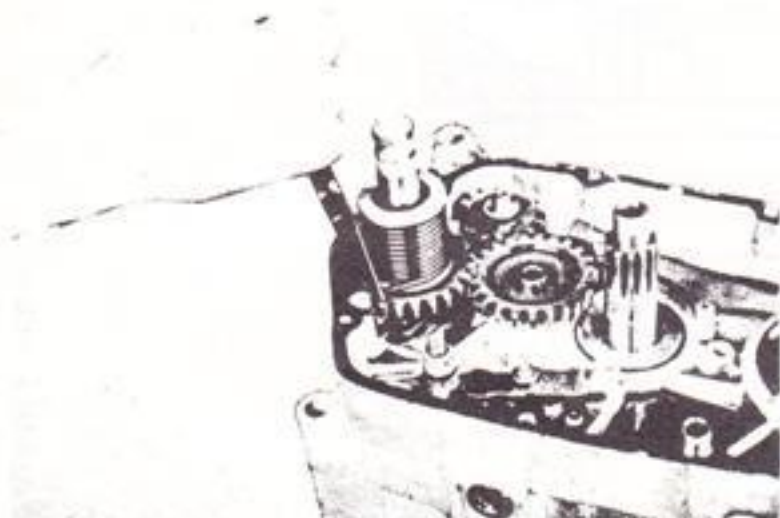


Fig 4-11-3

2) Then remove the kick starter assembly.



Fig 4-11-4

2 Reverse the sequence for reinstallation.

Notes on Assembling

- 1) Align the marking on the kick starter axle with that of the ratchet wheel.
- 2) When installing the kick starter assy in the crankcase, slide the ratchet wheel pawl over the ratchet wheel guide toward the stopper attached to the case. Make sure that the pawl is in close contact with the stopper. Then pull the spring forward and hook it on the stopper.

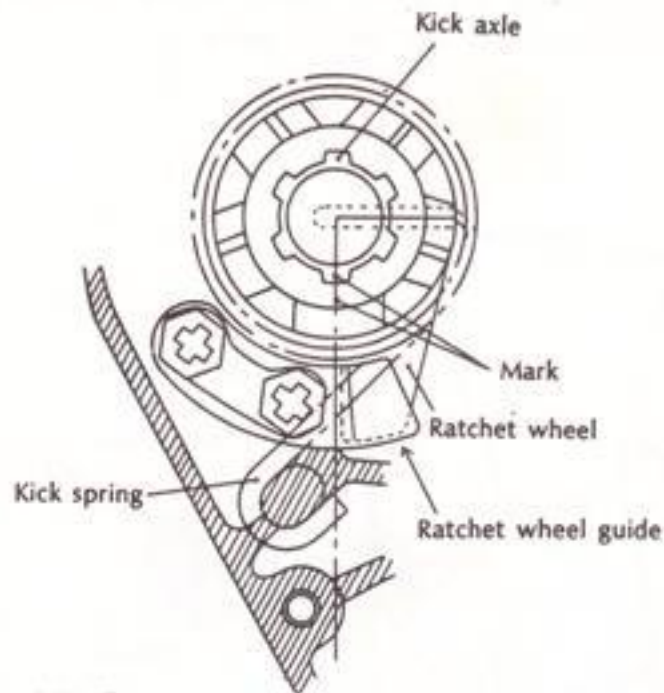


Fig 4-11-5

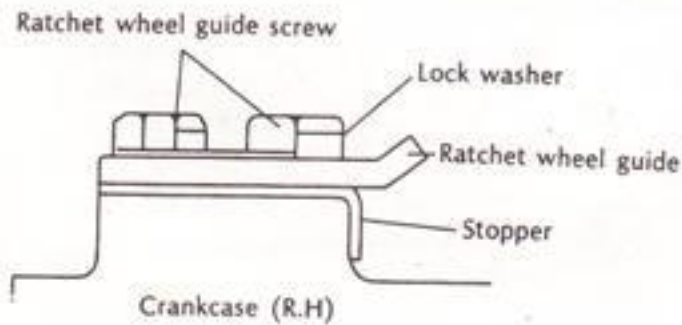


Fig 4-11-6

3 Removing the Kick Idler Gear

Remove the circlip with clip pliers, and then the kick idler gear can be easily removed.

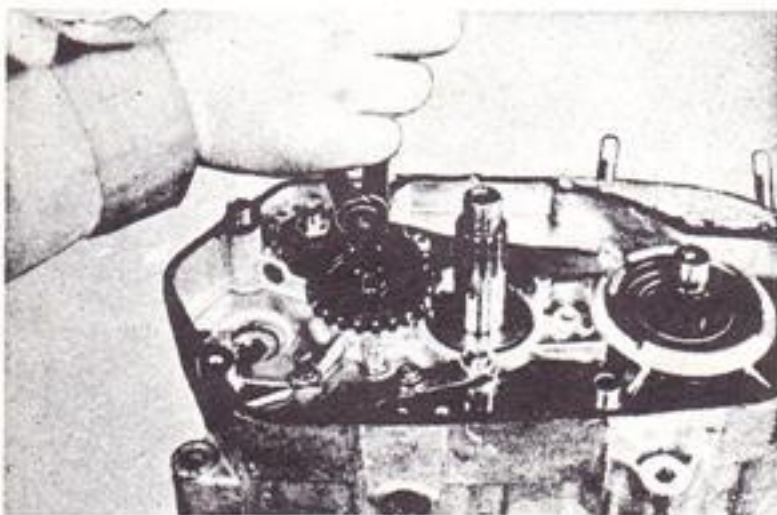


Fig 4-11-7

4 Removing the Tachometer Drive Gear

The tachometer drive gear is engaged with the kick idler gear to convey the revolutions per minute of the crankshaft to the tachometer through the tachometer cable.

Remove the clip with pliers and the tachometer drive gear can be removed.

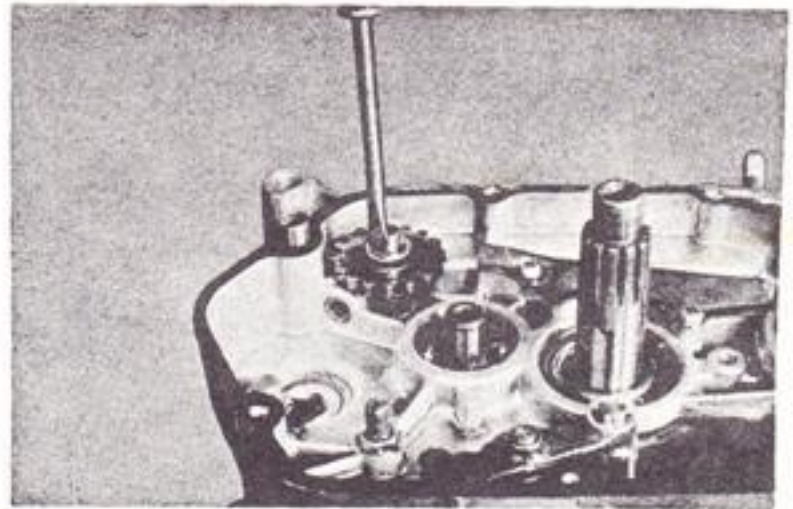


Fig 4-11-8

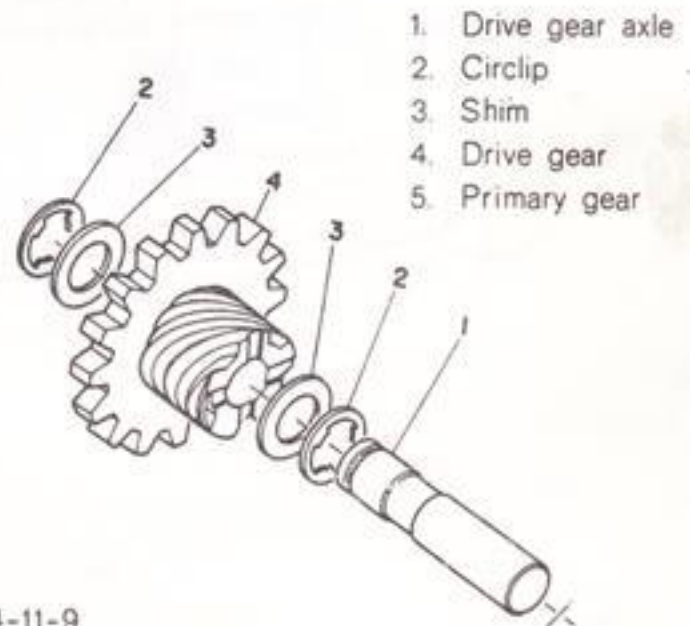


Fig 4-11-9

4-12 Shift Mechanism

The DT1-E has been designed to allow the owner to convert it to an optimum output competition machine by installing Yamaha's GYT parts. Therefore, the machine in standard form has been constructed to assure smooth and accurate gear shifting by using an already proven shifting mechanism.

The shift cam drum has one shift fork and two other shift forks are installed on a guide bar located parallel to the cam drum. The three shift forks slide back and forth in the slotted guides that are grooved in the shift drum. A safety device has been provided to prevent the shifter from by-passing the next gear when a quick or hard shift is made. This provides dependability and assurance for correct shifting for the desired gear even under

the roughest conditions such as comperition racing. A see-saw type shifting arrangement is used that enables the rider to shift quickly and easily down for the lower

gears and up for the higher gears. Neutral position is located between first and second gears.

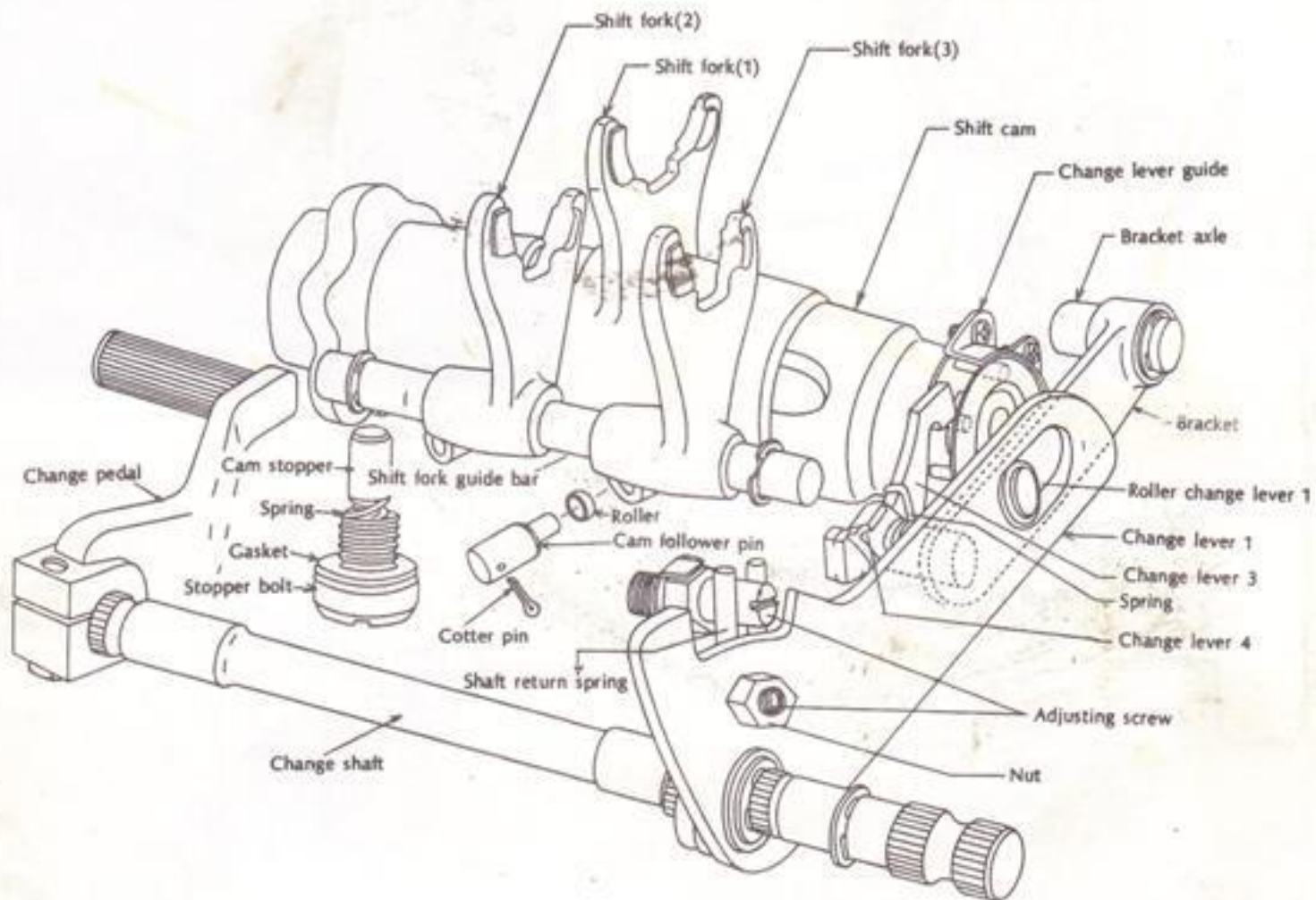


Fig 4-12-1

1 Removing the Change Axle Assembly

1) Remove the change axle sealing boot.

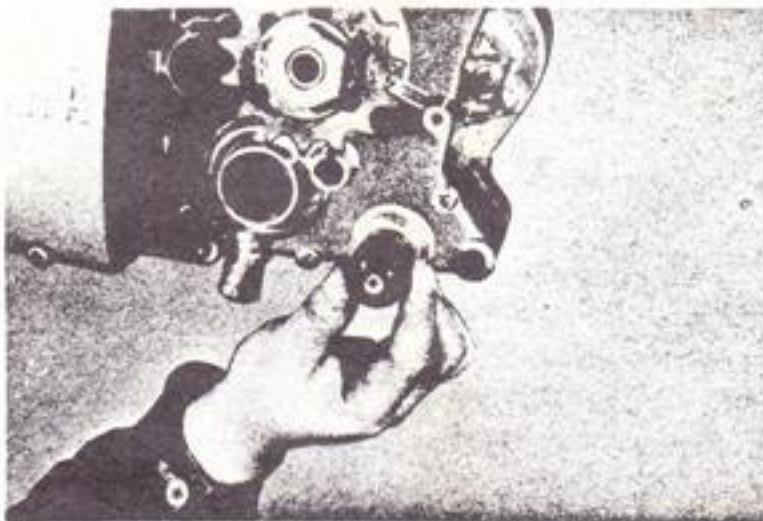


Fig 4-12-2

2) Pull out the change shaft assembly.

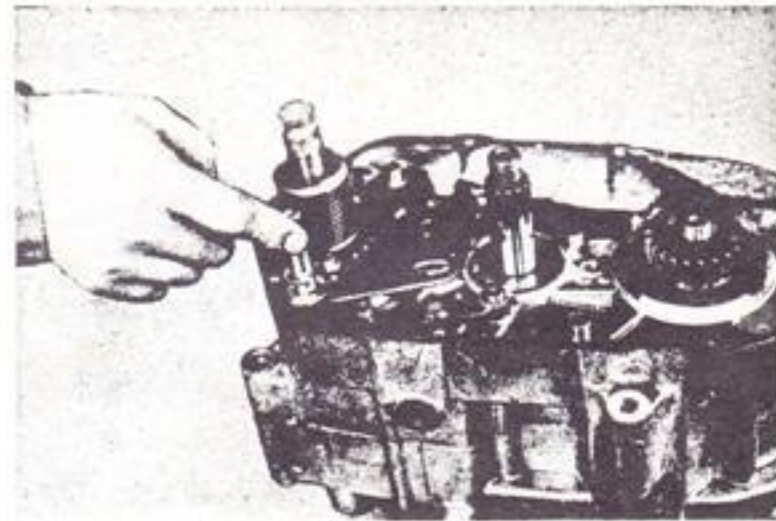


Fig 4-12-3

2 Checking the Gear Shift Parts

- 1) Check the gear shift return spring. A broken or fatigued gear shift return spring will impair the return action of the shifting mechanism.



Fig 4-12-4

3 Removing the Change Lever 3 and 4

Remove F clip with slot-head screwdriver, and the change lever can be removed.

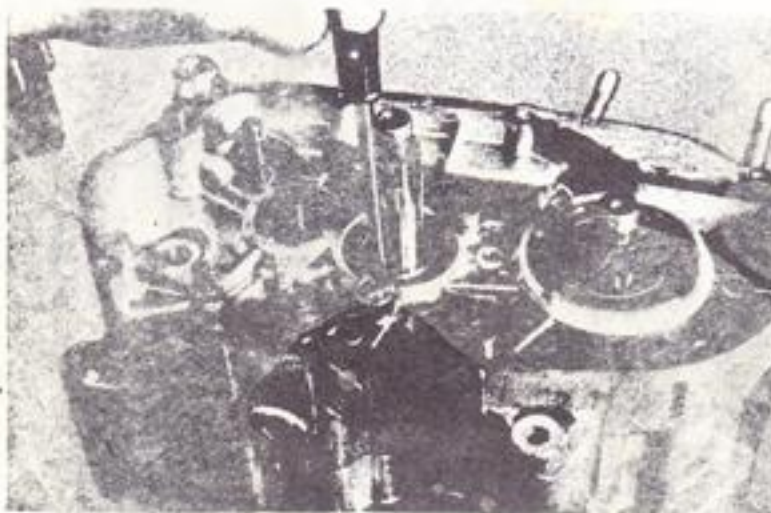


Fig 4-12-5

4 Checking the Change Lever Spring

Check for a fatigued or broken change lever spring. A faulty change lever spring may result in an improper shifting sequence.

5 Gear Change Adjustment

- 1) Fully move the gear change lever up and down and turn the adjusting bolt (eccentric bolt) on the case so that the clearance (a) will become equal to the clearance (a') (a) is the clearance

between the bent part of change lever 3 and the stopper (shaded area in the drawing) and (a') is the clearance between the bent part of the stopper. The stopper is a device for preventing the shifter from overrunning the correct position. After the adjustment, lock the adjusting screws with the lock nut.

- 2) Next turn the adjusting screw (eccentric screw) on change lever 4 so that the clearance (b) will become even with the clearance (b') on each gear position.

(b) is the clearance between the pin and change lever 4. After the adjustment, lock the adjusting screw with the lock nut.

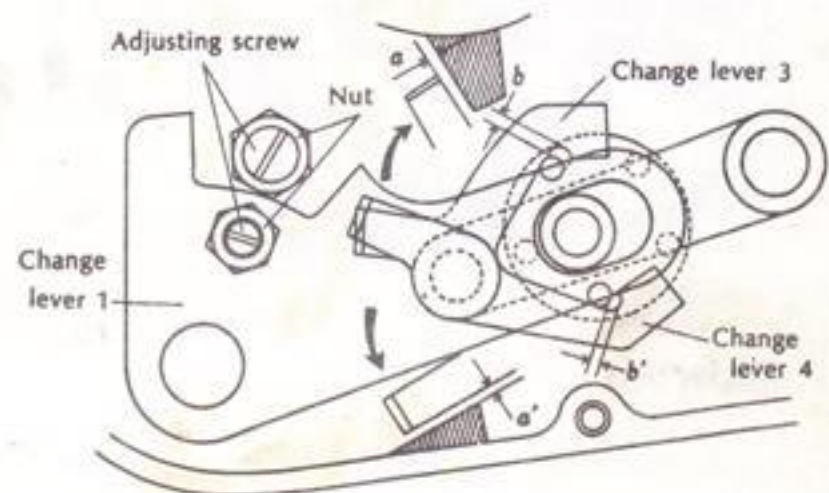


Fig 4-12-6

4-13 Drive Sprocket

1 Removal

- 1) Straighten the bent edge of the lock washer with a blunt-ended metal punch.

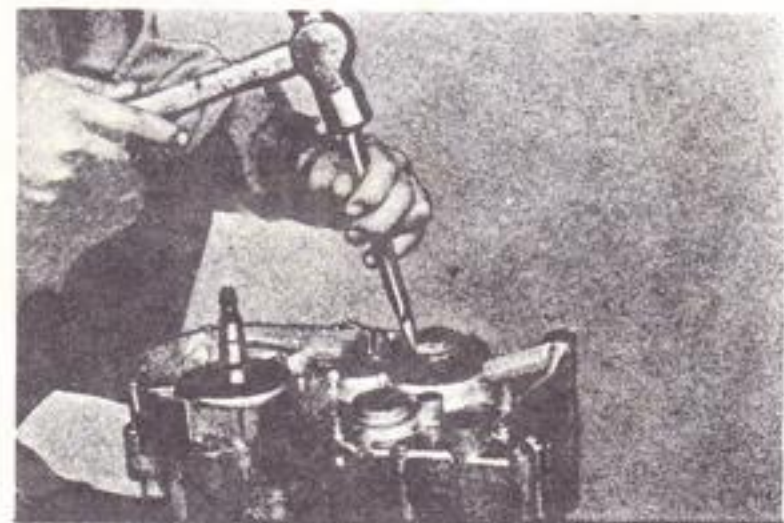


Fig 4-13-1

- 2) Keep the drive sprocket from turning with the holding tool, and remove the flywheel magneto

sprocket nut.

If the flywheel magneto puller is not available, shift the transmission to low gear, and fit a wrench on the sprocket nut. Then tap the handle of the wrench with a hammer and the shock will loosen the nut.



Fig 4-13-2

2 Inspection

A worn drive sprocket will result in excessive chain noise, and shorten the life of the chain. Check the sprocket for worn teeth, and replace if it is worn.

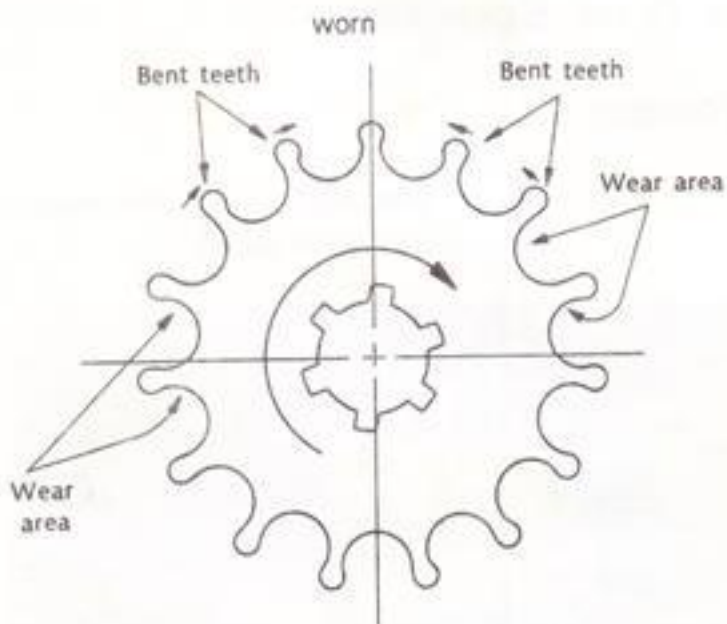


Fig 4-13-3

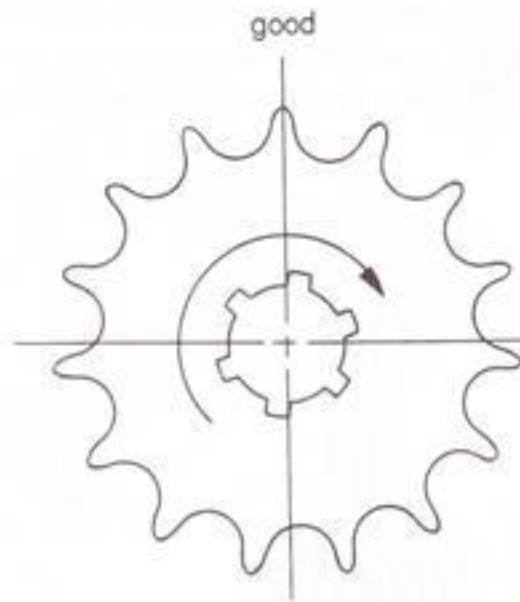


Fig 4-13-4

4-14 Crankcase

1 Separating

- 1) Remove neutral stopper.

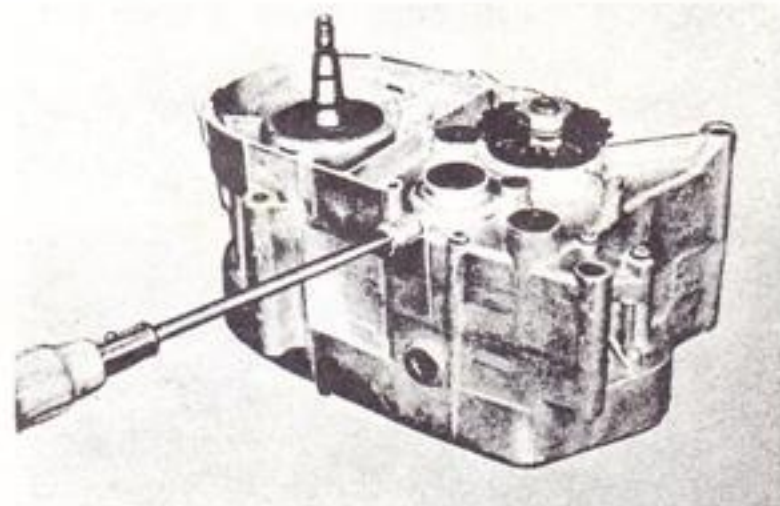


Fig 4-14-1



Fig 4-14-2

- 2) Remove the change lever guide.

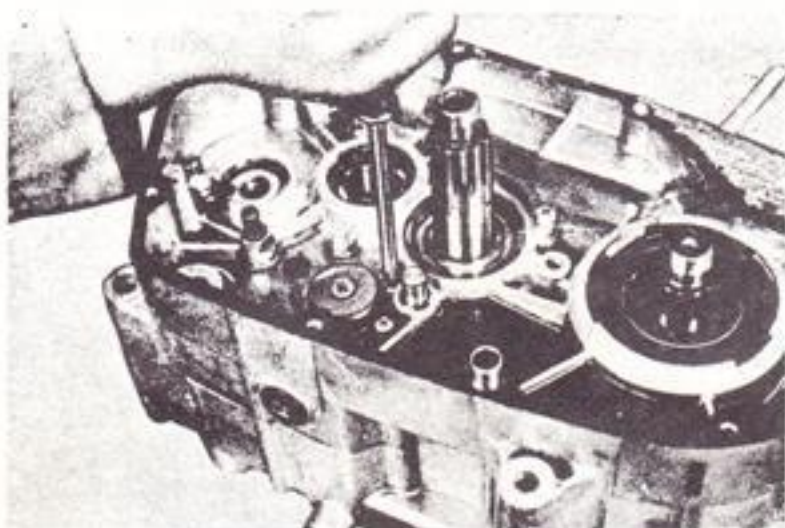


Fig 4-14-3

- 3) Remove the pan head screws from the left crankcase.

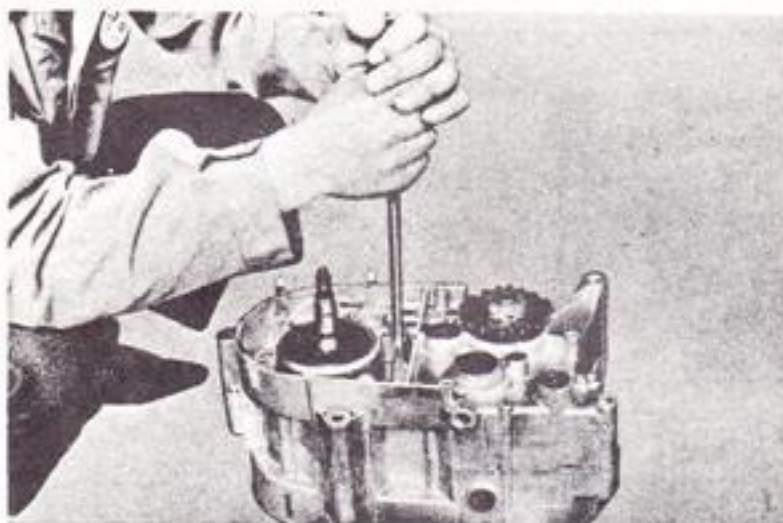


Fig 4-14-4

- 4) Install the crankcase separating tool on the right crankcase. Divide the crankcase while tapping the main axle and the crankcase alternately with plastic tip hammer.

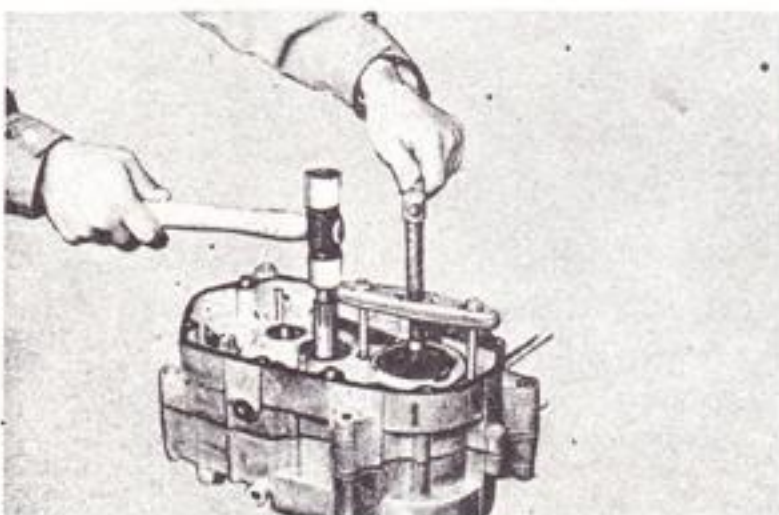


Fig 4-14-5

Note:

Fully tighten the bolts of the crankcase dividing tool, and keep the tool in a horizontal position. The crankcase is designed to split into two halves, right and left.

Only one drain plug is provided for both the transmission and clutch housings. Both housings can be drained at the same time by removing the drain plug.

2 Reassembling

When reassembling the crankcase, be sure to apply YAMAHA BOND No.5 to the mating surfaces of both halves.

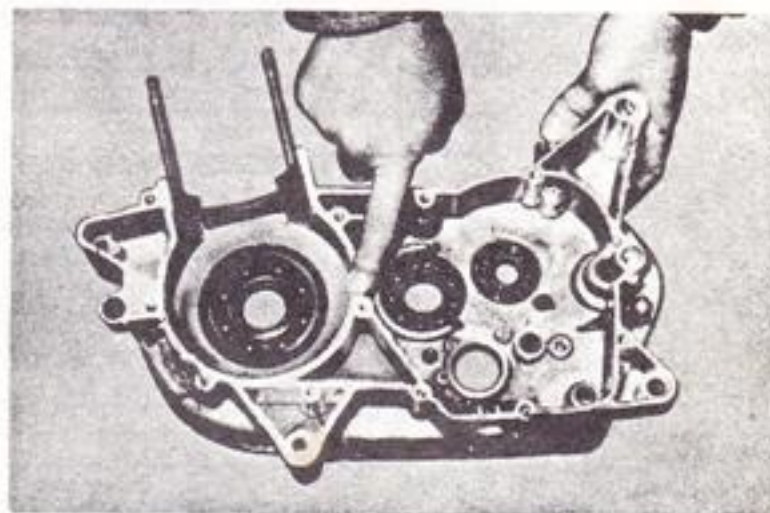


Fig 4-14-6

4-15 Transmission Assembly

The constant mesh wide ratio 5-speed transmission makes it possible to fully utilize the performance of the engine throughout the entire speed range from low to high. The top pinion is similar in type to the third gear wheel, and the third gear pinion is similar to the top gear wheel. For layout of the transmission and related part, refer to Fig. 4-15-1 and 2. The primary reduction ratio is $65/21 = 3.095$. Therefore the total reduction ratios will be :

$$\text{Primary reduction ratio} \times \text{Transmission gear reduction} \times \text{Secondary reduction ratio} = \text{Total reduction ratio.}$$

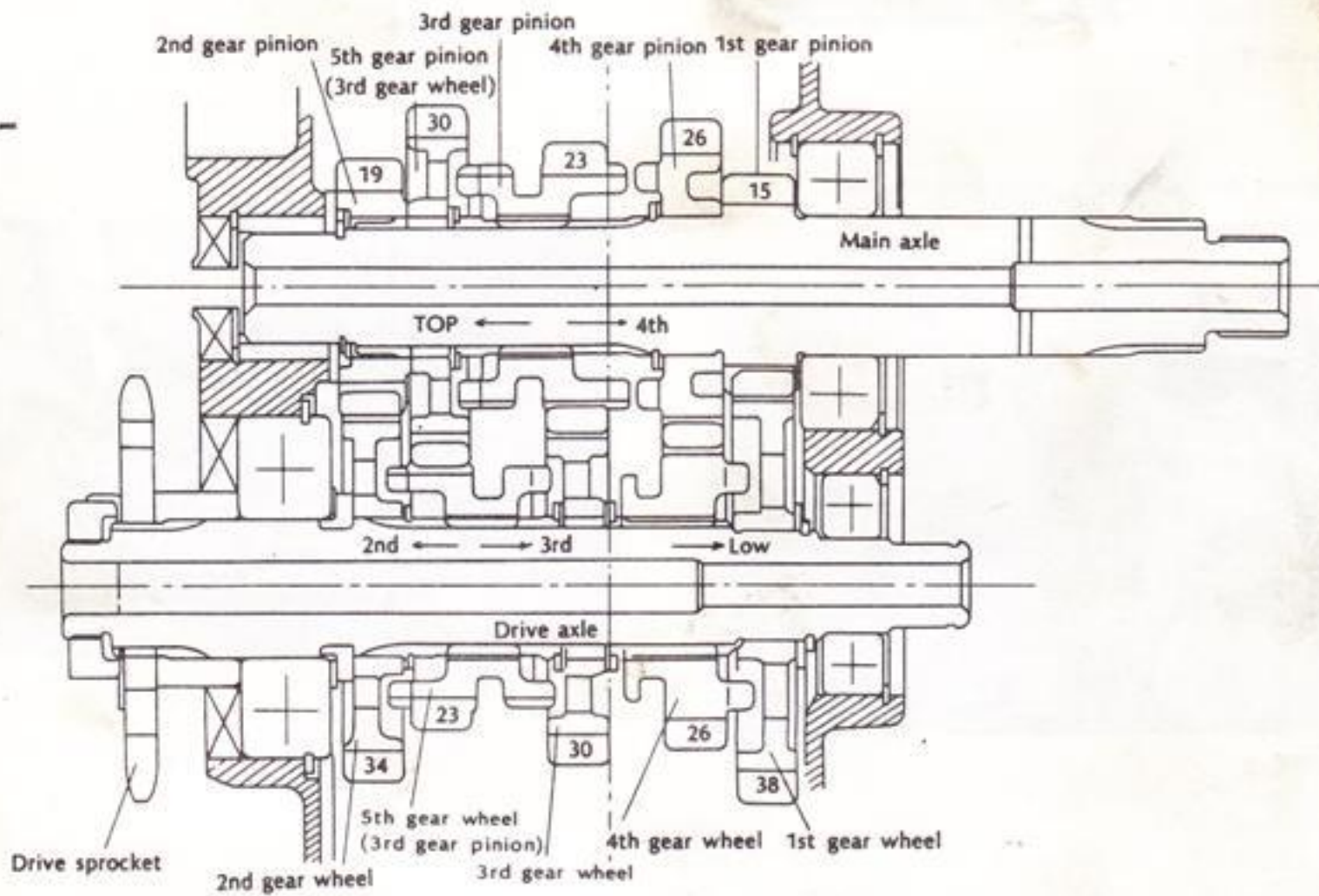


Fig 4-15-1

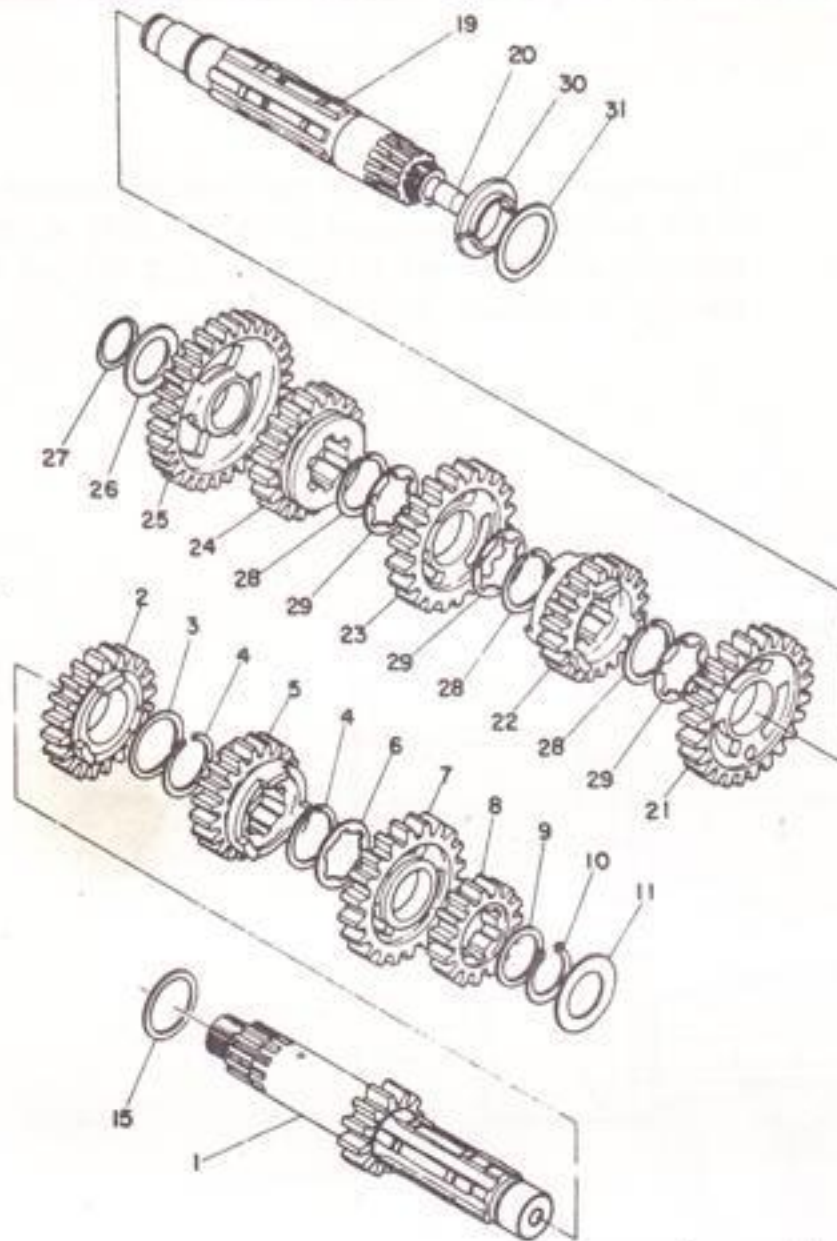


Fig. 4-15-2 Component parts of transmission

Component parts of transmission

1. AXLE, main
2. GEAR, 4th pinion
3. WASHER, gear hold
4. CIRCLIP
5. GEAR, 3rd pinion
6. WACHER, gear hold
7. GEAR, 3rd wheel
8. GEAR, 2nd pinion
9. WASHER, gear hold
10. CIRCLIP
11. SHIM
12. BEARING
13. CIRCLIP
14. OIL SEAL
15. SHIM, main axle
16. BEARING
17. CIRCLIP
18. GEAR, Kick pinion
19. AXLE, drive
20. PLUG, blind
21. GEAR, 2nd wheel
22. GEAR, 3rd pinion
23. GEAR, 3rd wheel
24. GEAR, 4th wheel
25. GEAR, 1st wheel
26. WASHER, gear hold
27. CIRCLIP
28. CIRCLIP
29. WASHER, gear hold
30. SPACER, drive axle
31. SHIM, drive axle

1. Removal

Remove the transmission and shifter as an unit.

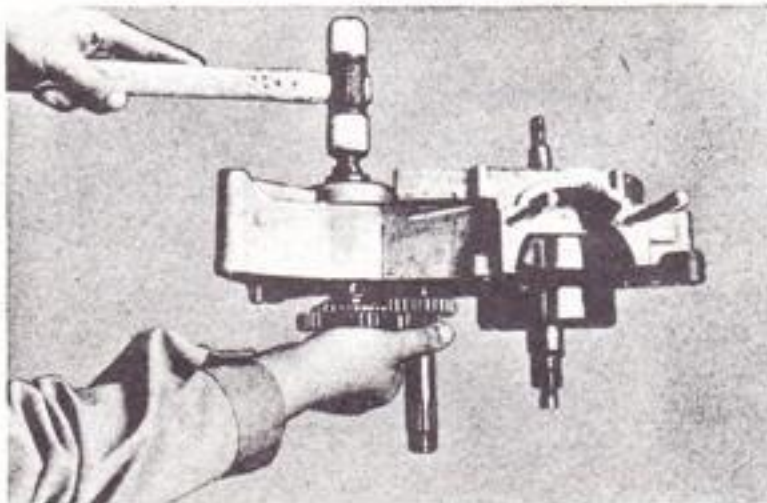


Fig 4-15-3

2 Reinstallation

Reinstall the transmission and shifter as an unit in the left crankcase half after they are sub-assembled. They can not be installed separately. The transmission unit must be in neutral during installation.

4-16 Crankshaft

The crankshaft requires the highest degree of accuracy in engineering and servicing of all the engine parts. The crankshaft is also more susceptible to wear, and therefore, it must be handled with special care.

To increase the inertia force of the crank, the diameter of the crankshaft is increased to 30 mm (1.18 in.) the thickness of the flywheel to 26 mm (1.02 in.) and its diameter to 110 mm (4.33 in.)

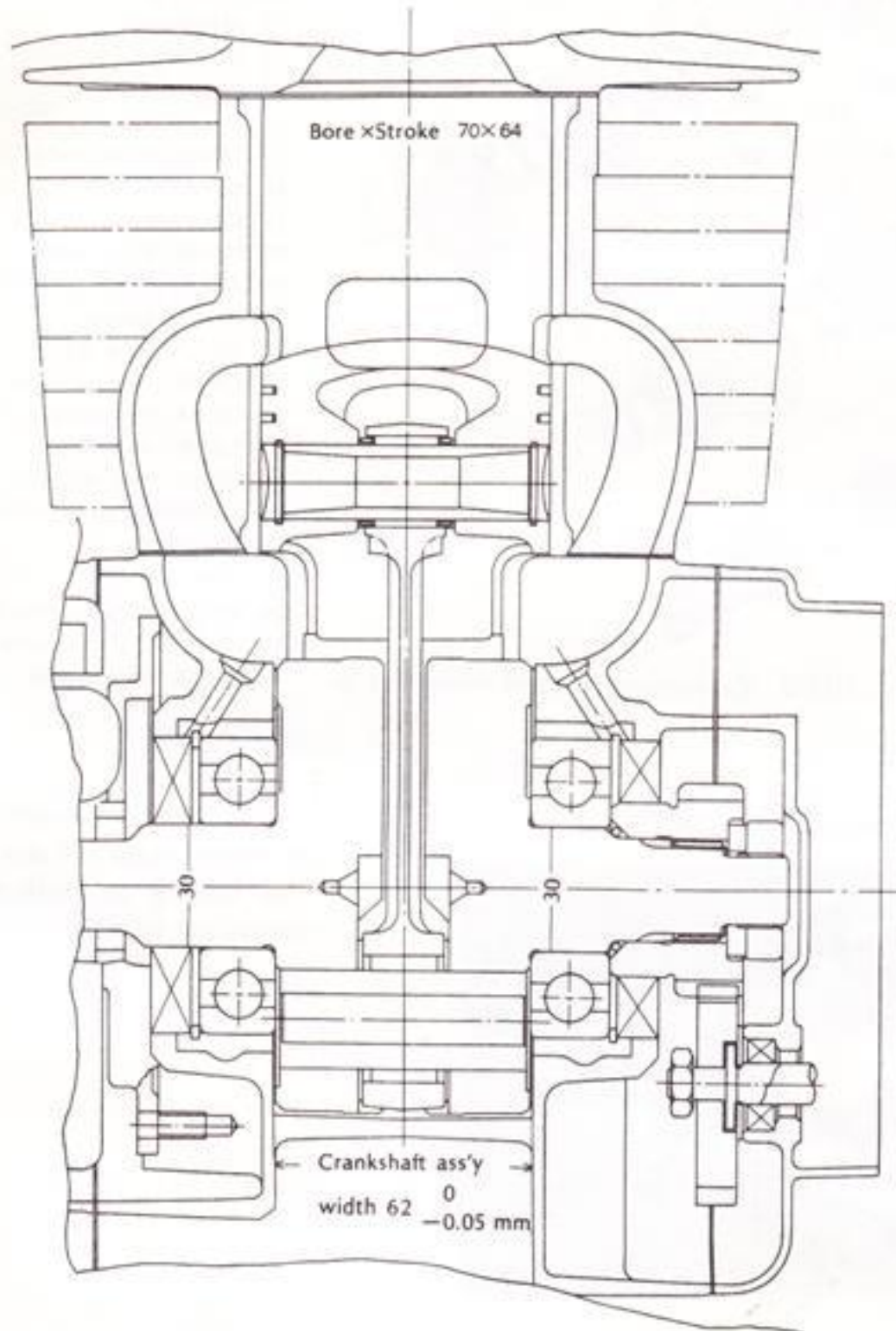
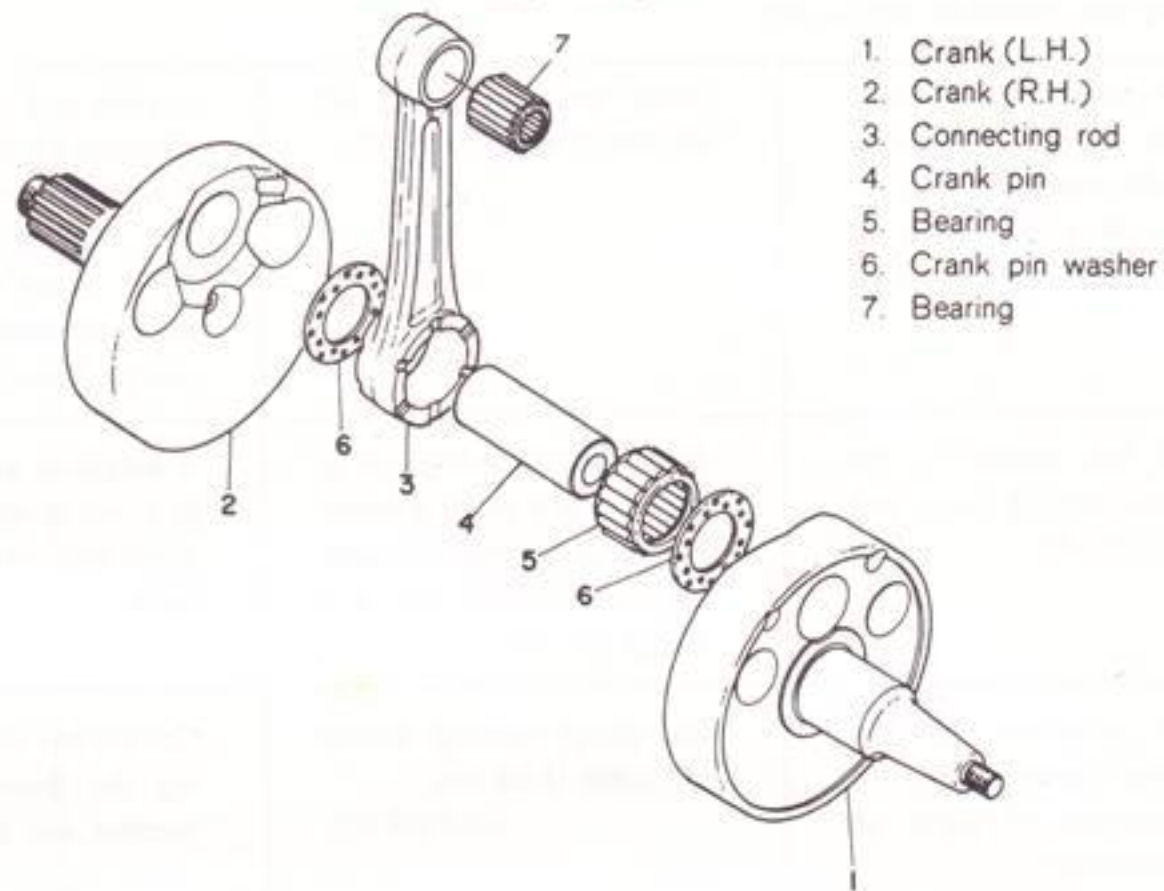


Fig 4-16-1

Crankshaft component parts



1. Crank (L.H.)
2. Crank (R.H.)
3. Connecting rod
4. Crank pin
5. Bearing
6. Crank pin washer
7. Bearing

Fig 4-16-2

1 Removing the Crankshaft Assembly

Remove the crankshaft assembly with the crankcase separating tool.

Note:

Fully tighten the bolts of the crankcase dividing tool, and keep the tool in parallel with the crankcase surface.

Note:

- 1) The crankshaft setting tool is the same as those used for YG1, and YF1.
- 2) The crank fitting spacer is required because the crankshaft is larger in diameter. The oil seal is larger in outside diameter than crankshaft setting tool body.

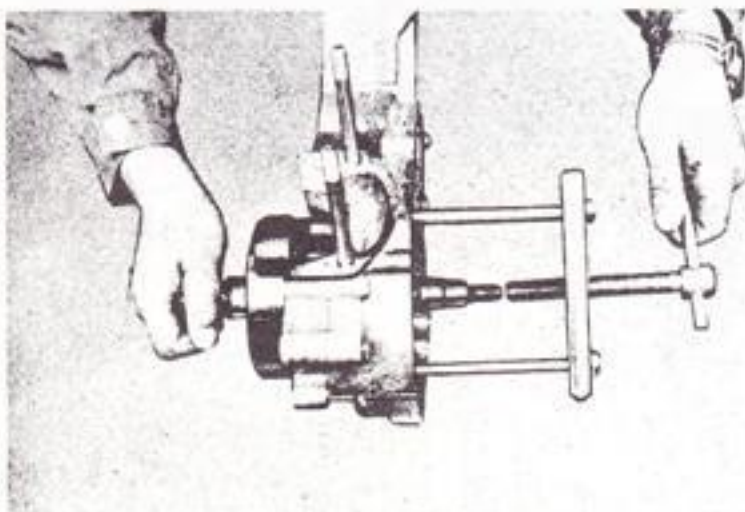


Fig 4-16-3

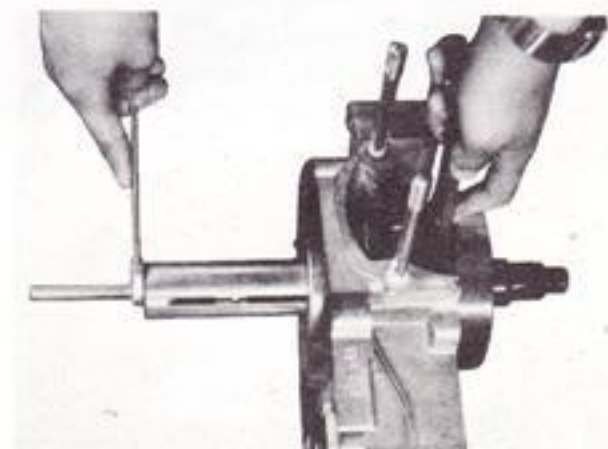


Fig 4-16-4

2 Installing the Crankshaft Assembly

Install the crankshaft assembly by using the crankshaft setting tool and the crank fitting the spacer. Hold the connecting rod at top dead center at with one hand while turning the handle of the setting tool with other.

3. Inspection and Servicing

1) Checking the crankshaft components

<p>Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at large end)(Fig. 4-16-5)</p>	<p>Small end play should not exceed 2 mm.(0.078 in.)</p>	<p>If small end play exceeds 2 mm, disassemble the crankshaft, check connecting rod crank pin and large end bearing. Replace defective parts. Small end play after re-assembly should be within 0.8-1.0 mm.(0.031~0.04 in.)</p>
<p>Check the connecting rod for axial play at large end. (Fig. 4-16-6)</p>	<p>Move the connecting rod to one side and insert a feeler gauge. Large end axial play should be within 0.4—0.5 mm.(0.019 in.)</p>	<p>If excessive axial play is present, (0.6 mm or more) disassemble the crankshaft and replace any worn parts.</p>
<p>Check accuracy of the crankshaft ass'y runout. (Misalignment of parts of the crankshaft) (Fig. 4-16-7)</p>	<p>Dial gauge readings should be within 0.03 mm. (0.0012 in.)</p>	<p>Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge.</p>

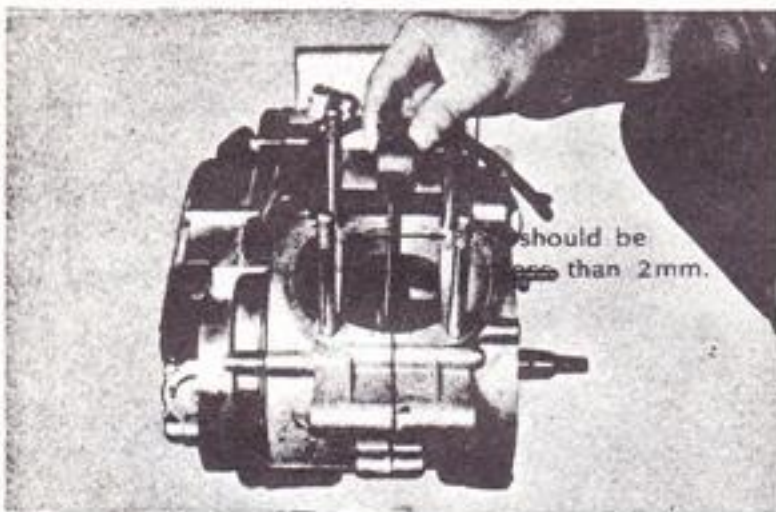


Fig. 4-16-5

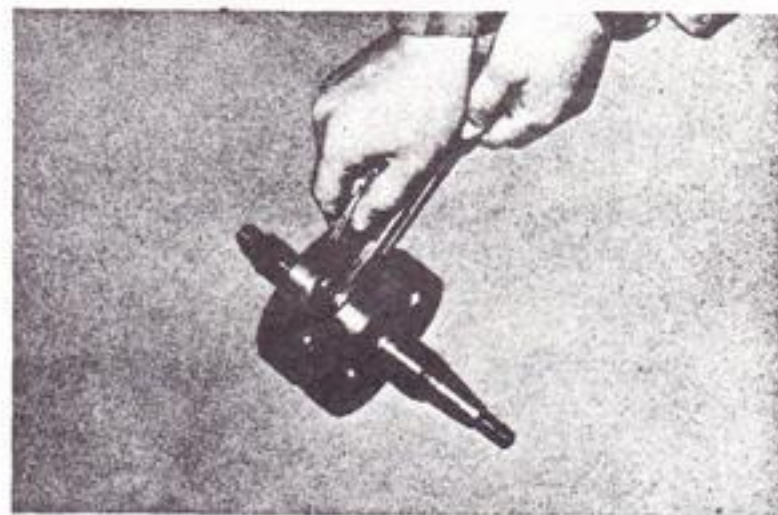


Fig. 4-16-6

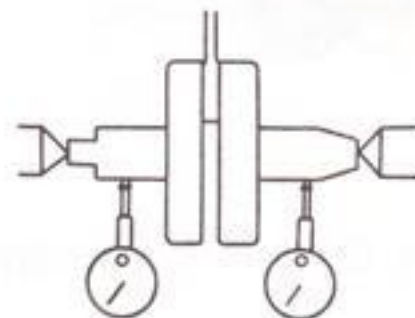


Fig 4-16-7

4-17 Bearings and Oil Seals

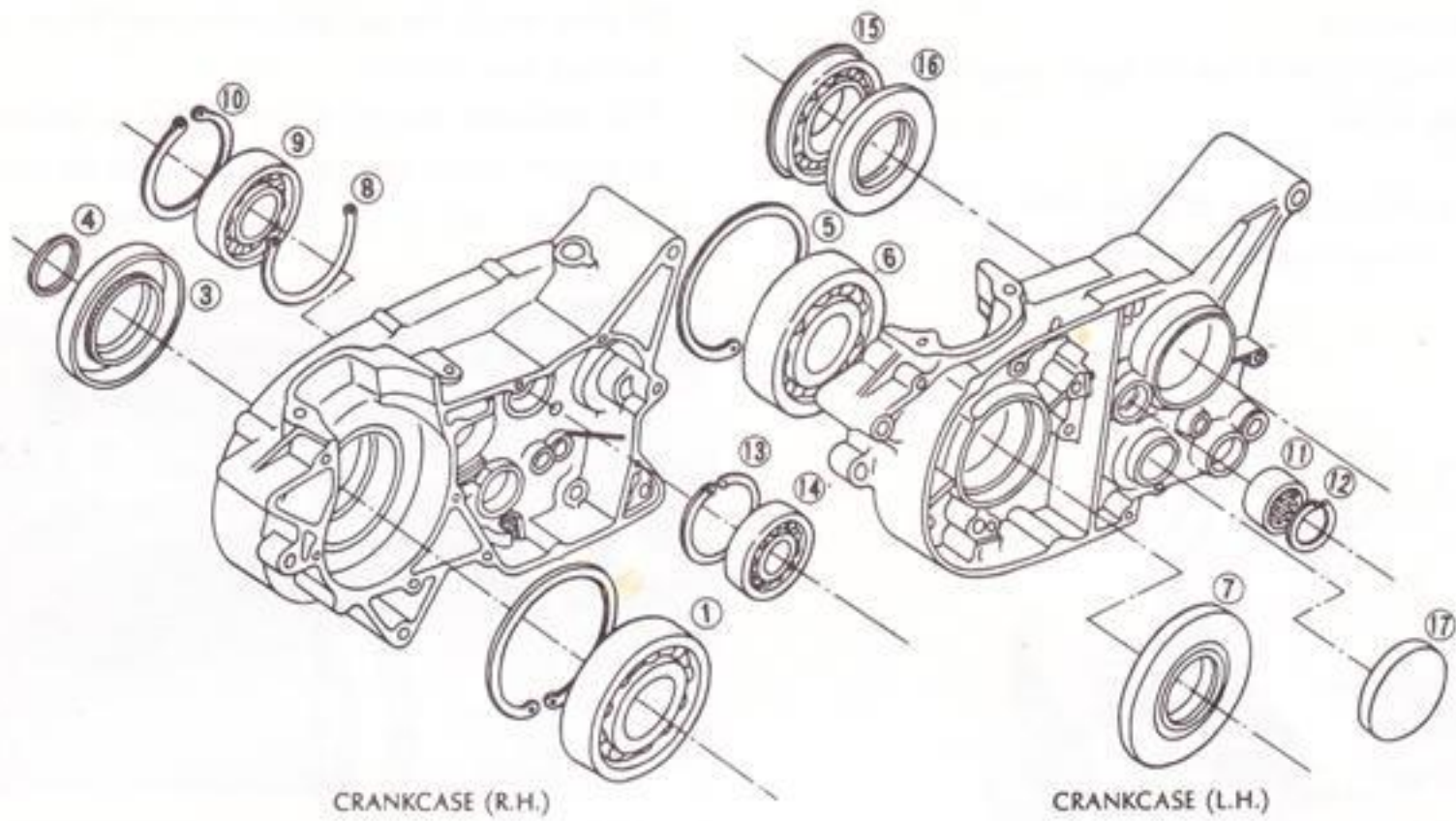


Fig. 4-17-1

- | | | |
|------------------------|-------------------------|-------------------------|
| 1. Bearing 6306 | 7. Oil seal SW30-72-10 | 13. Circlip |
| 2. Circlip R-72 | 8. Circlip 25.1-31-0.3 | 14. Bearing 6203 |
| 3. Oil seal SW42-72-10 | 9. Bearing 6205 | 15. Bearing 6305NR |
| 4. O-ring 3.2-24.5 | 10. Circlip | 16. Oil seal SD-35-62-6 |
| 5. Circlip R-72 | 11. Bearing 20-26-16 | |
| 6. Bearing 6306 | 12. Circlip 25.1-31-0.1 | |

1) Removal and Installation

1) Removal

- a. Pry the oil seals out of place with a slot head screwdriver.
Always replace the oil seals when overhauling the engine.

Note: Place a piece of wood under the screwdriver to prevent damage to the case.



Fig. 4-17-2

- b. Remove the bearing with a bearing puller.

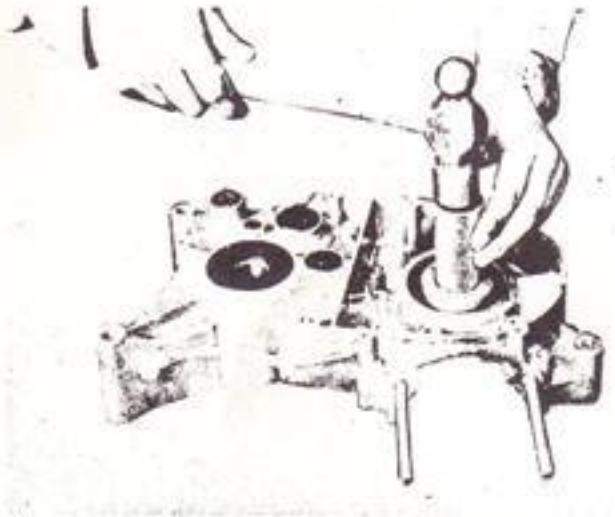


Fig. 4-17-3

2) Installation

Install bearings and oil seals with their stamped manufacturer's marks or numerals facing out ward. (In other words, the stamped letters must be on the exposed view side.)

The crankshaft bearing circlip should be installed so that the circlip end gap is aligned with the arrow marked on each of the crankcase halves.

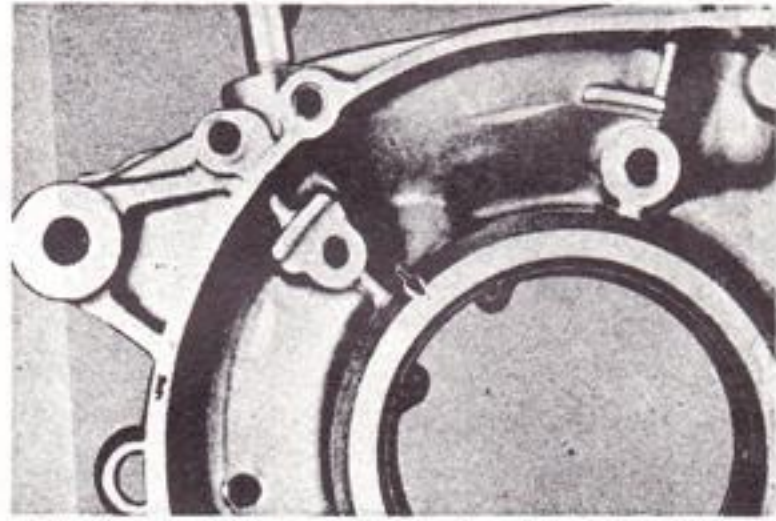


Fig. 4-17-4

4-18 Carburetor

The standard DT1-E is equipped with a VM 26 SH (26 mm.) carburetor that is equipped with a built-in starter jet.

The carburetor is bolted to a 30 mm. thick bakelite insulator that is between the carburetor and cylinder. This insulator provides more than adequate heat in-

sulation. The carburetor floats have been specially designed to keep the float level from fluctuating due to vibration or shock. The main jet is installed in such a manner to provide quick and easy replacement from the outside by merely removing the jet holder on the bottom left side of the carburetor float bowl.

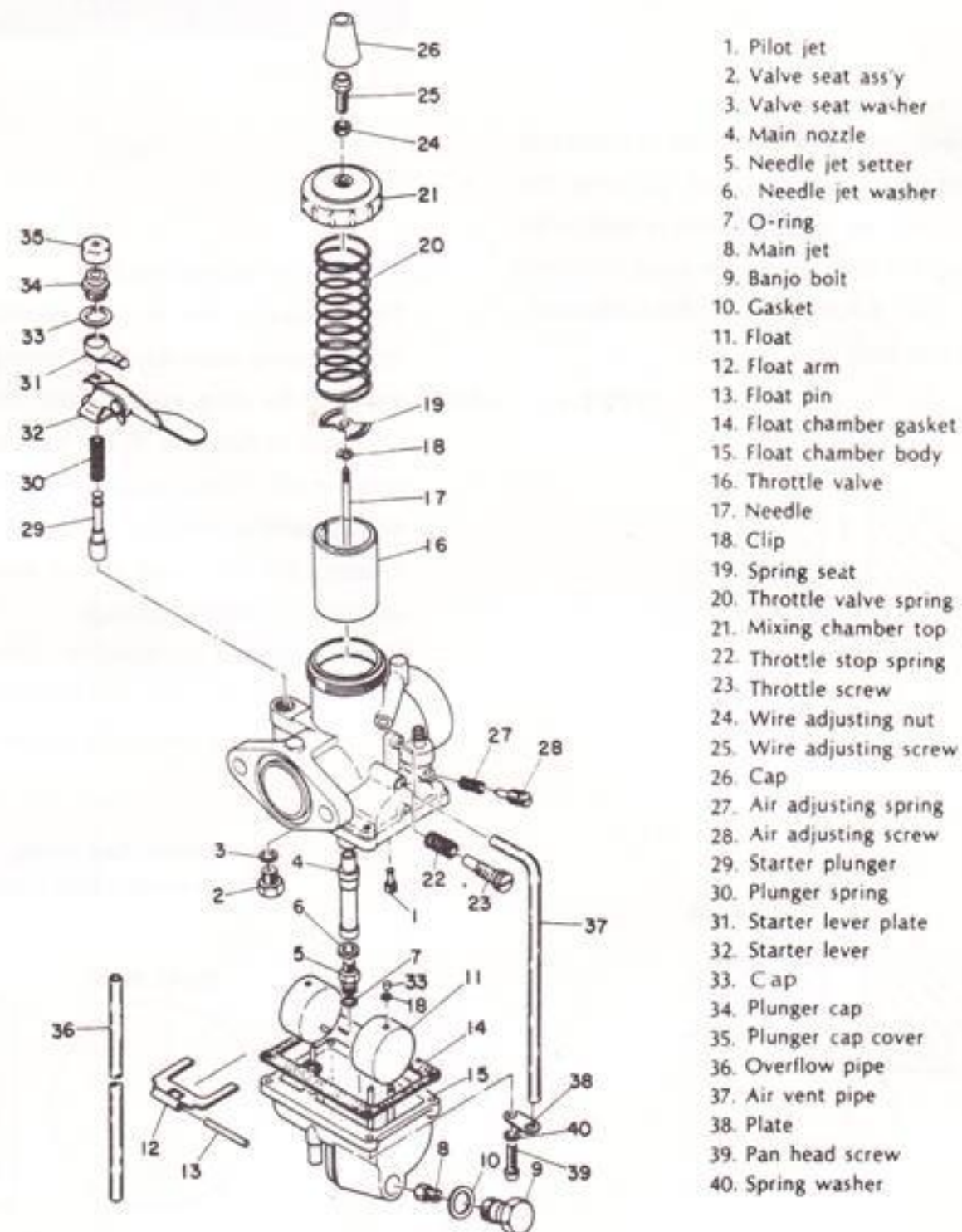


Fig. 4-18-1 Exploded view of carburetor

1. Checking the Carburetor

1) Float

Remove the float and shake it to check if gasoline is inside. If fuel leaks into the float while the engine

is running, the float chamber fuel level will rise and make the fuel mixture too rich. Replace the float if it is deformed or leaking.

2) Float valve

Replace the float valve if its seating end is worn with a stop or if it is scratched. Check the float valve spring for fatigue. Depress the float valve with your finger, and make sure that it properly seats against the valve seat when released. If the float valve spring is weakened, fuel will overflow, flooding the float chamber while the gas is on.

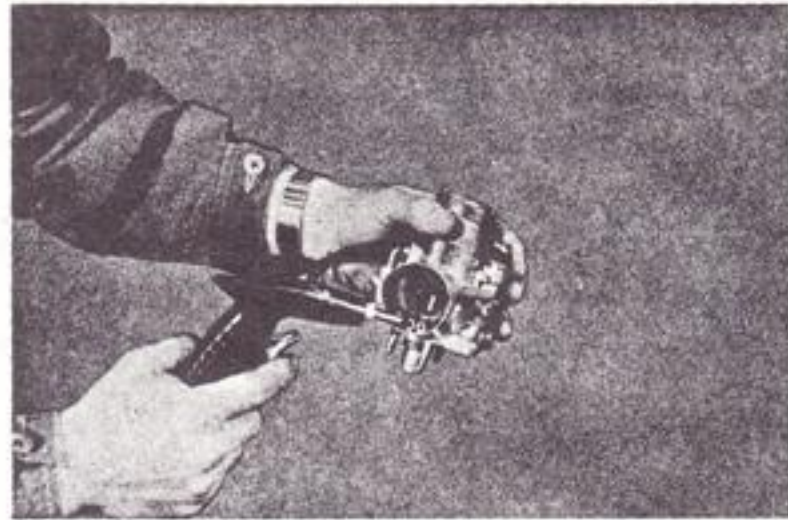


Fig. 4-18-4

3) Overflowing

If fuel overflows, check the carburetor as described in 1) and 2) above. If neither 1) nor 2) cures the overflowing, it may be caused by dirt or dust in the fuel preventing the float valve from seating properly. If any dirt or dust is found, clean the carburetor, petcock and gas tank.

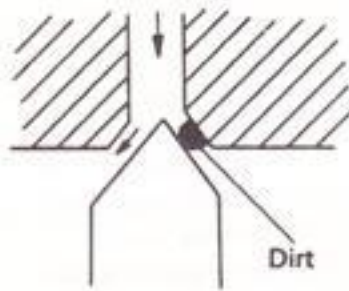


Fig. 4-18-2

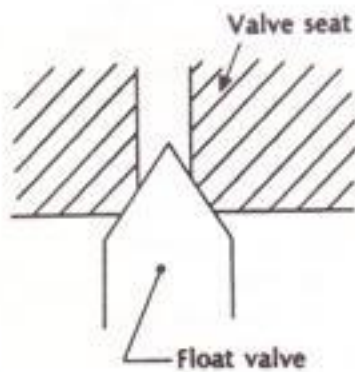


Fig. 4-18-3

4) Cleaning the carburetor

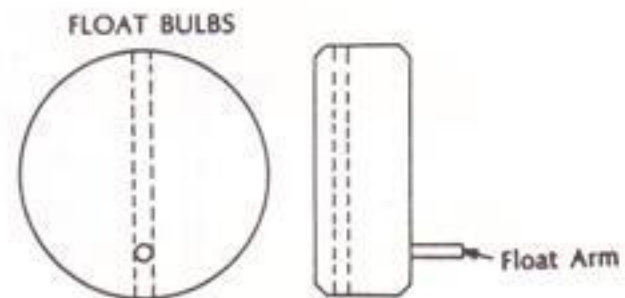
Disassemble the carburetor, and wash all its parts in a suitable solvent. Then blow all the parts off with compressed air. All jets and other delicate parts should be cleaned by blowing compressed air through them.

2. Float Level Adjustment

The carburetor float level is checked by the Yamaha factory during assembly and testing. But rough riding, worn needle valve, or bent float arm can cause the float level to fluctuate. If the float level raises, this will cause a rich fuel/air mixture that can cause poor performance and spark plug fouling. If the float level decreases, this can cause a lean fuel/air mixture that can result in engine damage.

If the machine is subjected to continuous rough riding or many miles of travel, the float level should be checked and set regularly and in the following manner.

Carburetor float setting:
(with needle spring unloaded)



When replacing the float bulbs, place float arm towards the bottom side of float bowl.

Fig. 4-18-5

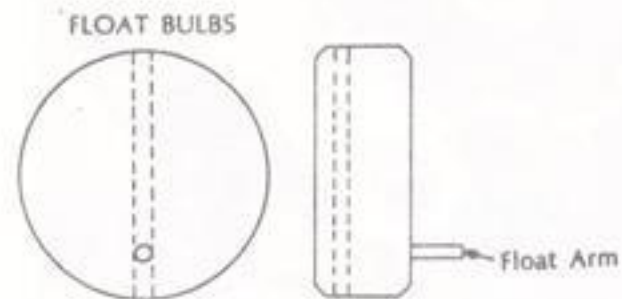
- 1) Remove the float chamber body, and turn over the mixing body. Let the float arm rest on the needle valve with the spring fully expanded.
- 2) Then measure the distance "A" from the float arm lever to the float chamber joint surface.
Standard measurement of A: 15.8 mm (0.622 in)
- 3) When the A distance measured is less than recommended bend the tang up. If it is greater, bend the tang down. (with carburetor body upside down.)

3. Idle Mixture-Idle speed Adjustment

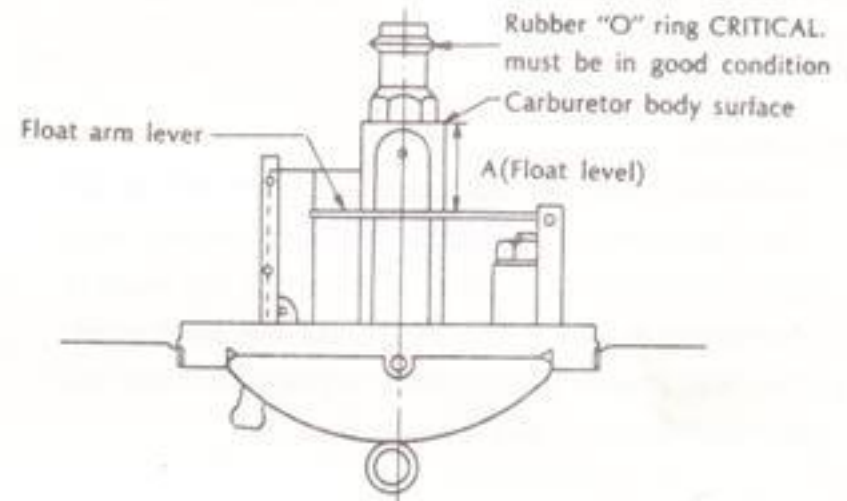
Turn the idle mixture screw in until lightly seated, then back it out $1\frac{1}{2}$ turns no more or no less. There is no need to experiment. This is a factory setting that can be set with the engine stopped. No further adjustment is required.

Engine idle speed is set by warming up the engine completely and then screwing the idle speed screw in or out, whichever direction is necessary for the engine to idle between 1,200 and 1,300 rpm.

Carburetor float setting:
(with needle spring unloaded)



When replacing the float bulbs, place float arm towards the bottom side of float bowl.



Set at center line.
Carburetor body must be held upside down when setting float level.

Fig. 4-18-6

4. Carburetor Setting Table

Name of Parts	Abbreviation	Specifications
Main jet	M. J.	160
Needle jet	N. J.	0-2
Jet needle	J. N.	5D1-3 stages
Pilot jet	P. J.	35
Starter jet	G. S.	60
Throttle valve cut away	C. A.	2.5
Air screw setting	A. S.	$1\frac{1}{2}$
Idling speed	—	$1,300 \pm 100$ r.p.m
Float level	F. L.	15.1 mm (0.594 in.)

4-19 Air Cleaner

1. Removal

To remove the air filter, open the seat cover and remove four air cleaner mounting screws. Then the element can be removed.



Fig. 4-19-1

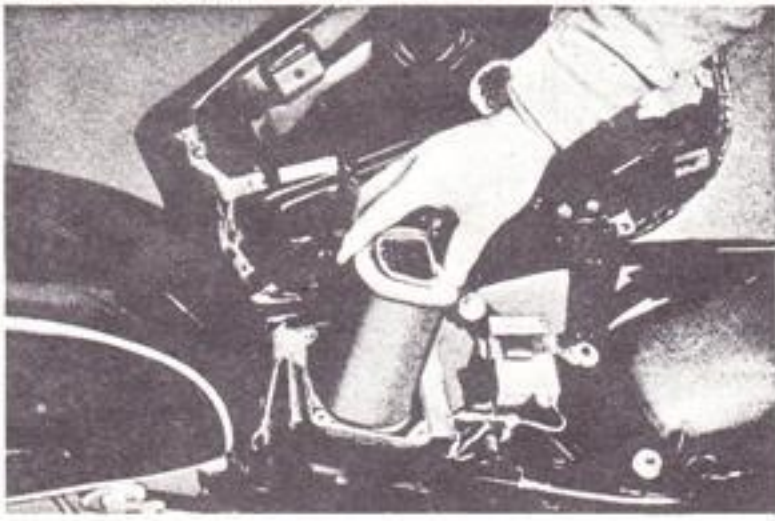


Fig. 4-19-2

2. Cleaning

Wash the foam filter thoroughly in solvent until all dirt has been removed. Squeeze all the solvent out. Pour oil onto the filter (any grade of 20 or 30 wt) work it completely in, and then squeeze out the surplus oil. The filter should be completely impregnated with oil, but not "dripping" with it.

CHAPTER 5 CHASSIS

The Yamaha DT1-E has been designed for versatility and a combination of uses. It is equipped with all necessary street legal equipment to insure pleasurable road or street riding. This machine can be quickly converted to a competition machine and therefore has been engineered to have a minimum weight factor. Yet with the reduction in weight, rigidity, strength, and safety have been incorporated in the design of the frame to provide an unexcelled competition machine.

5-1 Front Wheel

The 19" front wheel is equipped standard with a 3.25-19" Trials Universal tire. This tire gives the rider assurance of maximum performance and safety for both road riding and trail riding.

To insure against tire slippage on the rim, a tire bead lock had been installed in the wheel. The front wheel brake size is 150mm. x 30mm. (5.9 x 1.18 in.) A labyrinth seal is installed between the wheel hub and brake plate to provide a seal against dust water.

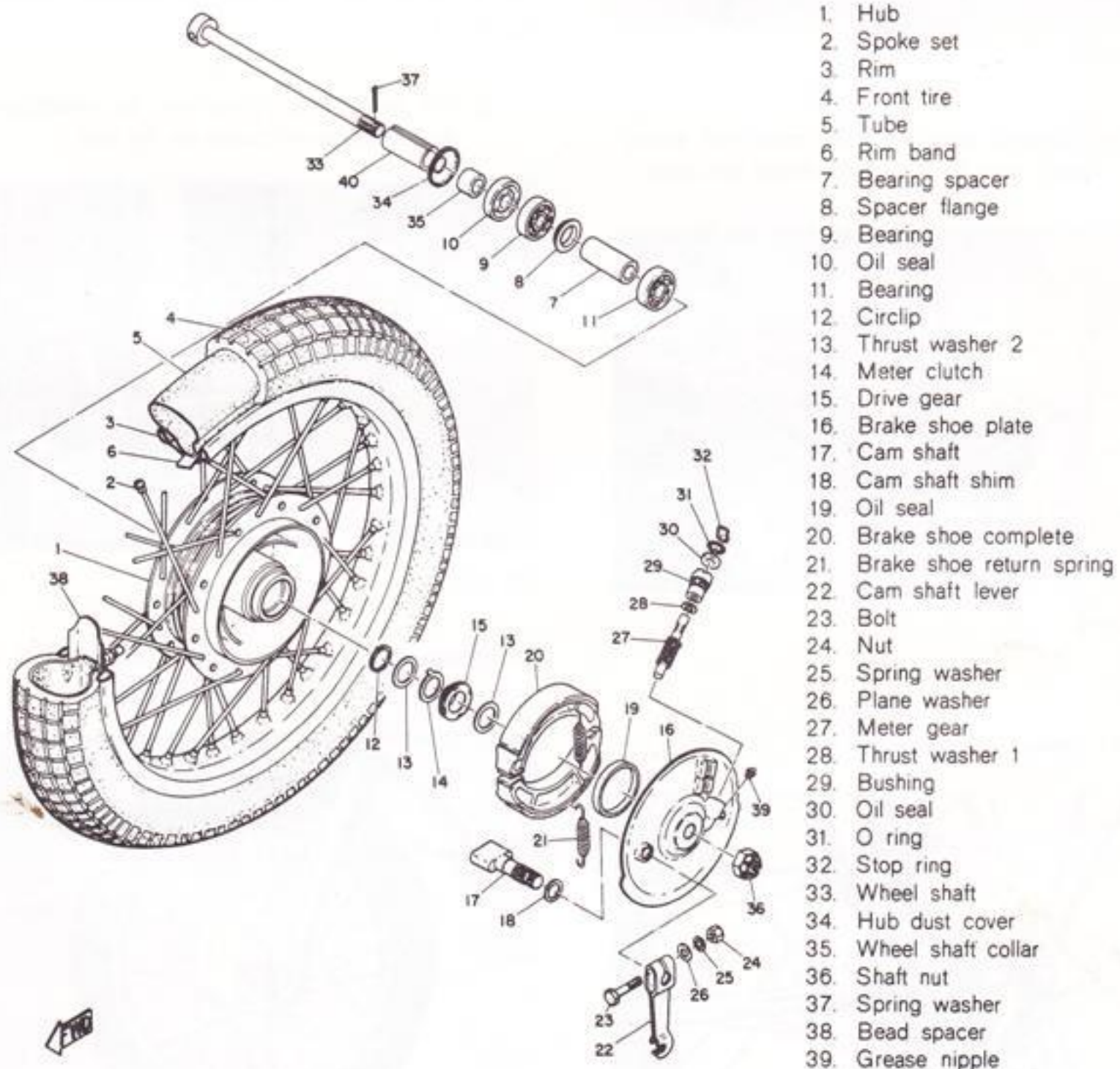


Fig 5-1-1 Construction

1 Removal

- 1) Disconnect the brake cable at the front brake lever.

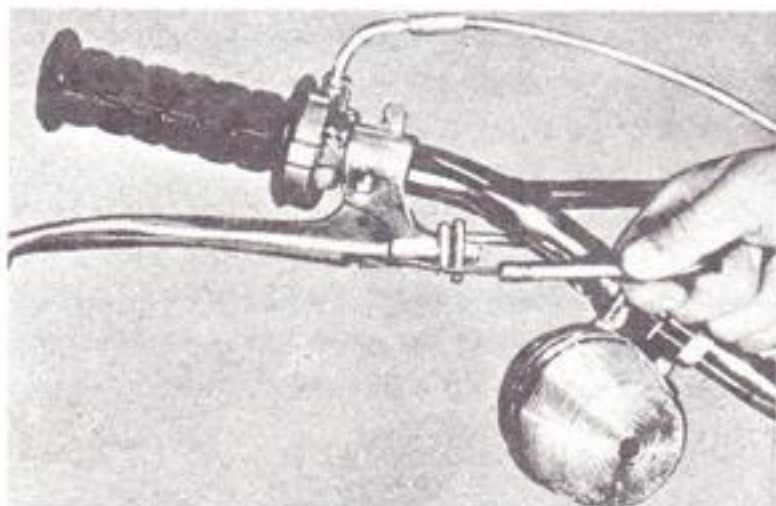


Fig 5-1-2

- 2) Disconnect both the brake cable and speedometer cable from the front wheel hub plate.

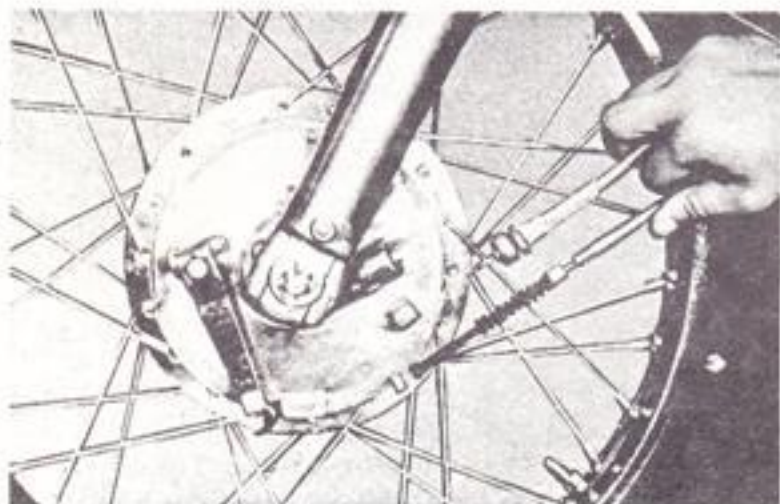


Fig 5-1-3

- 4) Remove the front wheel nut.

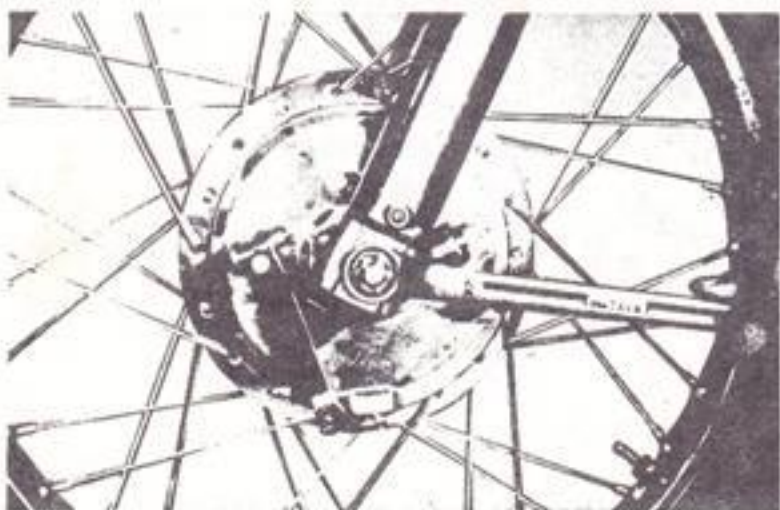


Fig 5-1-4

- 3) Loosen the front wheel axle lock nuts.

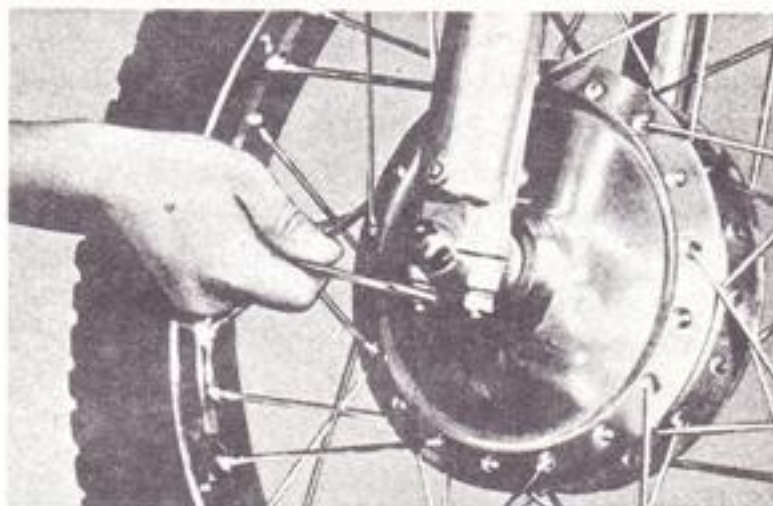


Fig 5-1-5

- 5) Pull out the front wheel axle by simultaneously twisting and pulling on the axle.

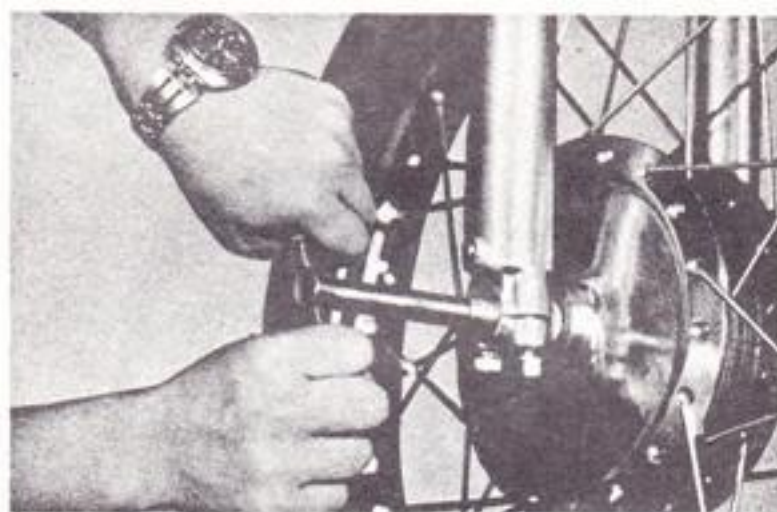


Fig 5-1-6

- 6) Raise the front of the machine and set it on a box. Then remove the wheel assembly.

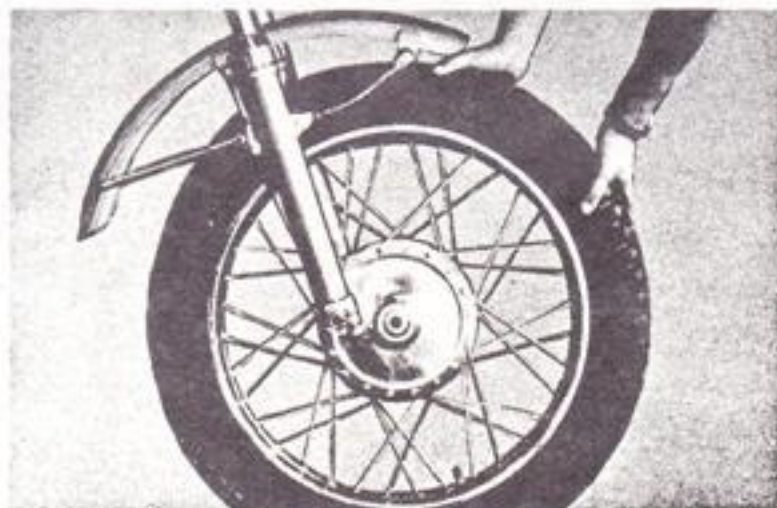


Fig 5-1-7

2 Checking

- 1) Run out of the rim
As show in Fig. 5-1-8, measure the runout of the rim with a dial gauge. Runout limits: 2mm. (0.07 in.) or less.

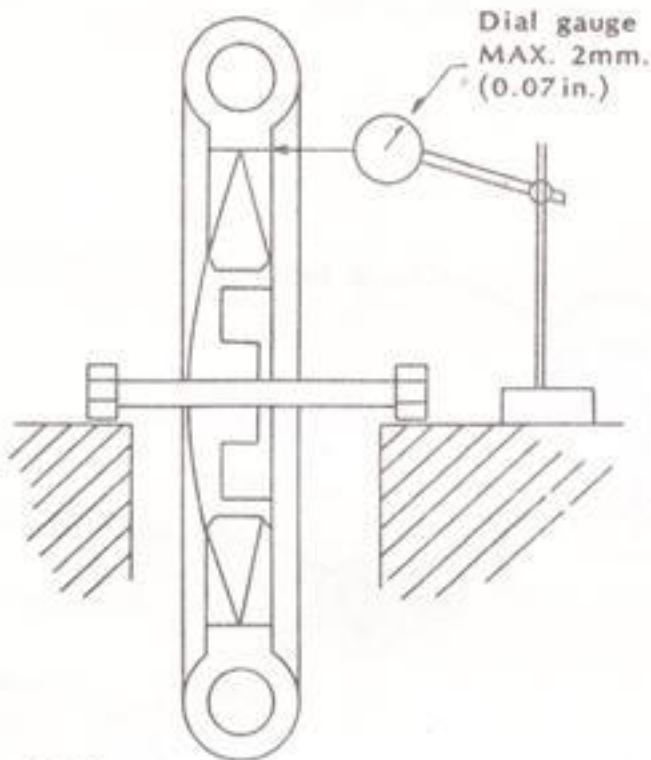


Fig 5-1-8

- 2) Brake shoe
Measure the outside diameter at the brake shoe with slide calipers. If it measures less than 146 mm. (5.75 in.), replace it. Smooth out a rough shoe surface with sandpaper or hand file.

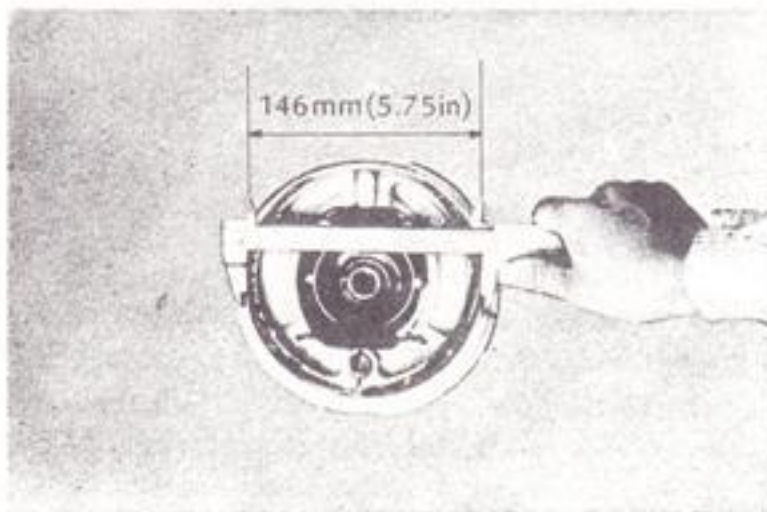


Fig 5-1-9

- 3) Brake drum
Oil or scratches on the inner surface of the brake drum will impair braking performance

or result in abnormal noises. Clean or smooth out the surface with a rag soaked in laquer thinner or with sandpaper.



Fig 5-1-10

- 4) Check the spokes. If they are loose or bent, replace or tighten them. If the machine is ridden in rough country often or raced the spokes should be checked regularly.
- 5) Repairing the brake shoe
If the brakes shoe has uneven contact with the brake drum or scratches, smooth out the surface with sandpaper or hand file.



Fig 5-1-11

- 6) If the tire is excessively worn replace the tire.
- 7) Check the tires for damage regularly.
- 8) If the bearings allow excessive play in the wheel or if it does not turn smoothly, replace the bearing.

Replacing the Wheel Bearing

- First clean the outside of the wheel hub.
- Insert the bent end of the special tool (as shown in Fig 5-1-13) into the hole located in the center of the bearing spacer, and drive the spacer out from the hub by tapping the other end of the special tool with a hammer. (Both bearing spacer and spacer flange can easily be removed.)
- Then push out the bearing on the other side.
- To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation and use the bearing fitting tool (furnished by Yamaha).

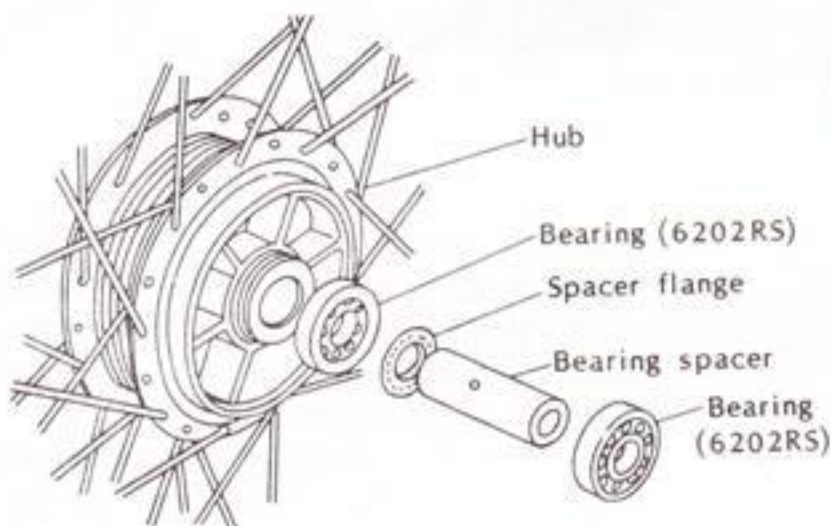
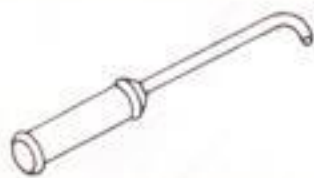


Fig 5-1-12



Insert the bent end of the special tool into the hole located in the center of the bearing spacer.

Fig 5-1-13

Replacing the Clutch Hub Bearing

- First remove the sprocket shaft by pushing it out toward the other side.
- Remove the sprocket shaft collar. (It can easily be pulled out with your hand.)
- Remove the oil seal. Exercise care not to damage the oil seal.

- Remove the circlip.
- Push out the clutch hub bearing toward the sprocket side by the use of the bearing fitting tool.
- To install the clutch hub bearing, reverse the above sequence. Before installation, grease the bearing and oil seal.

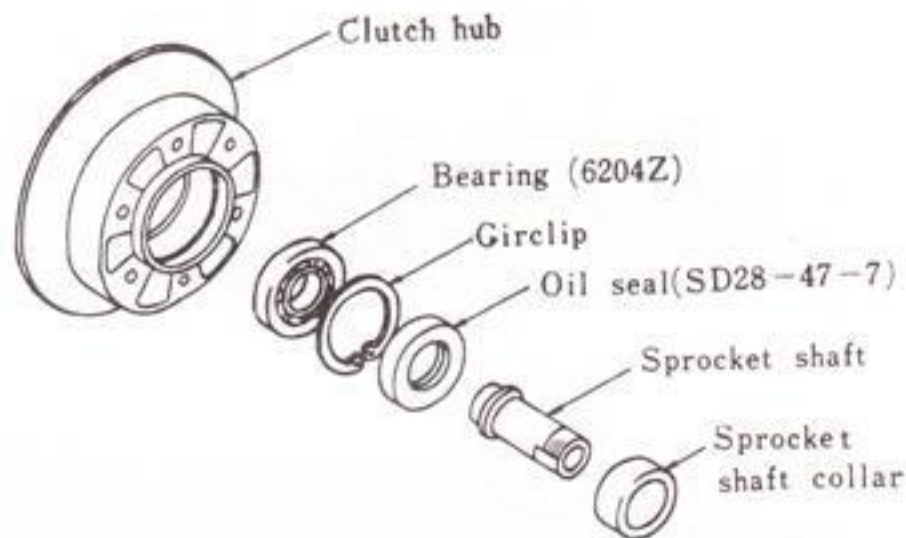


Fig 5-1-14

- Replace a bent or damaged front wheel axle.
- If the tooth surface of the helical speedometer drive gear is excessively worn replace it.
- Check the lips of the seals for damage or warpage. Replace if necessary.

5-2 Rear Wheel

The rear wheel is 18-in. size, and the rear tire is the 4.00-18 Trials Universal. It is also good for road riding. Two rim locks are provided to prevent tire slippage in the rim. The single leading shoe type brake is of the 150mm.x30mm.size. A labyrinth seal between the wheel hub and the brake plate is provided to prevent water and dust leakage. The brake tension bar is of link design to minimize the shifting of the brake cam lever position when the rear swing arm is moving up and down. The rear fender is steel, and rubber mounted on the frame. It is also wide enough to protect the engine unit from dust and water.

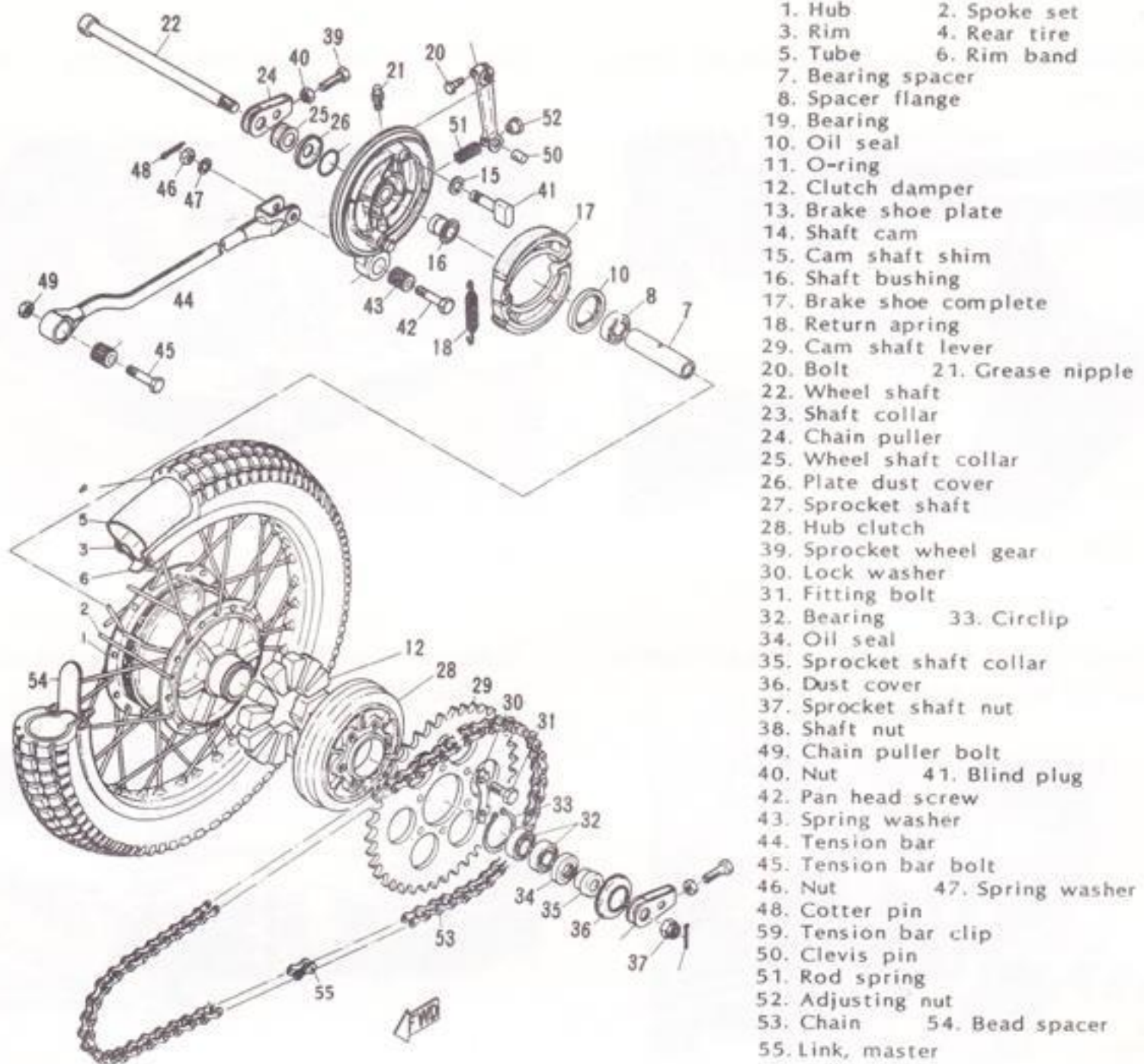


Fig. 5-2-1 Rear Wheel Construction

1. Removal

1) Remove the tension bar and brake rod from the rear shoe plate.

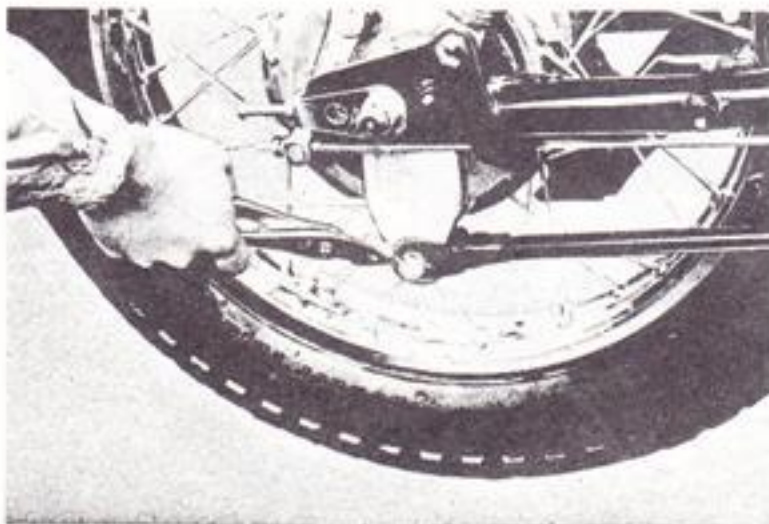


Fig 5-2-2

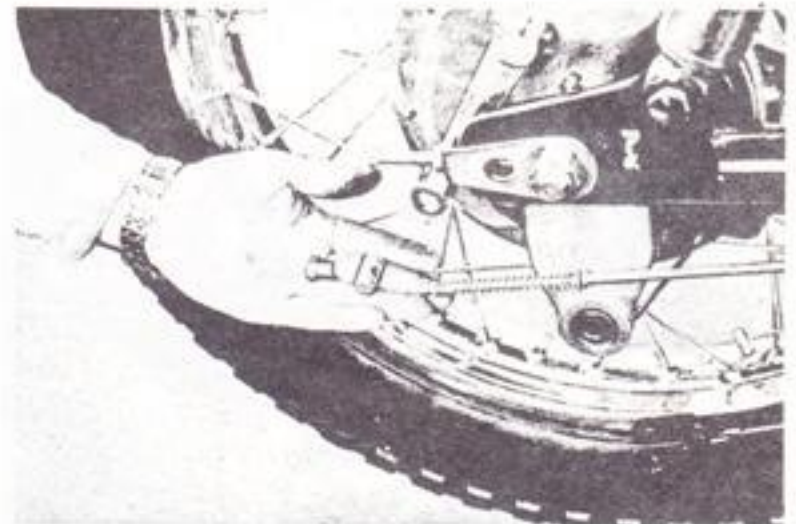


Fig. 5-2-3

2) Disconnect the master link of the chain and remove the chain.

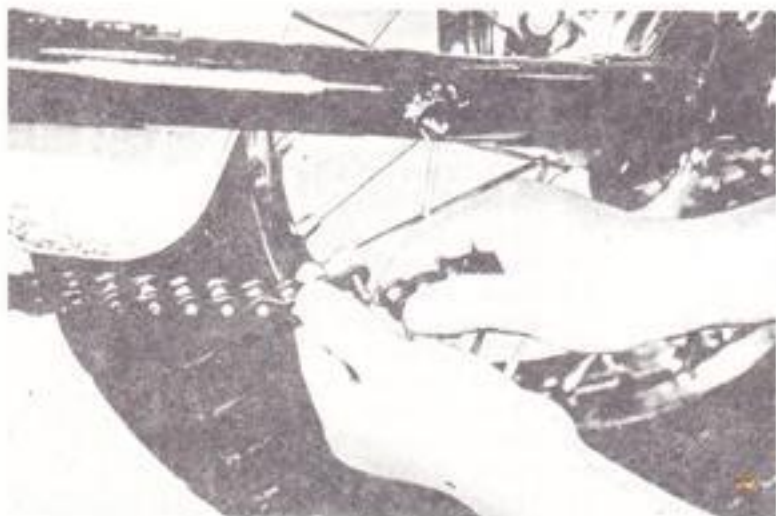


Fig 5-2-4

3) Loosen the chain tension adjusting nuts and bolts on both right and left sides.



Fig 5-2-5

4) Remove the rear wheel shaft nut.

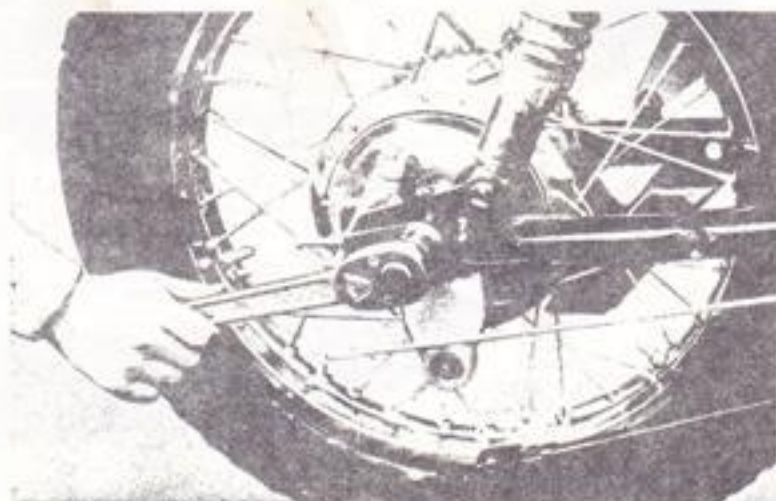


Fig 5-2-6

5) Pull out the rear wheel shaft by striking it with a plastic tip hammer.

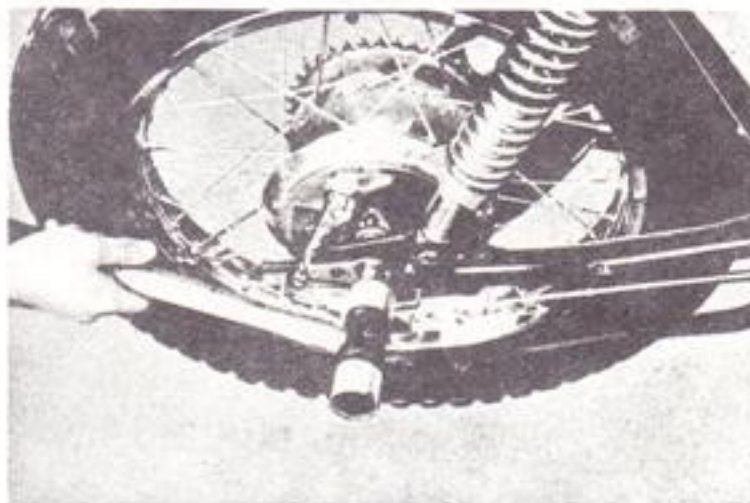


Fig. 5-2-7

6) Remove the right-hand chain puller and distance collar.

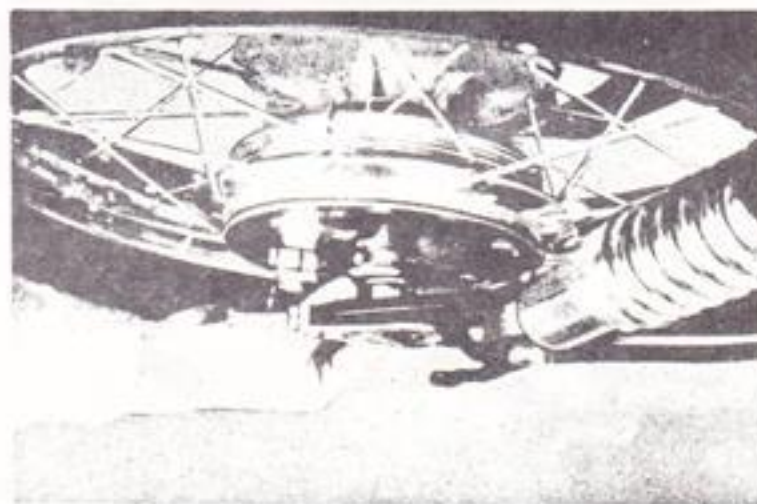


Fig 5-2-8

7) Lean the machine to the left and remove the rear wheel assembly.

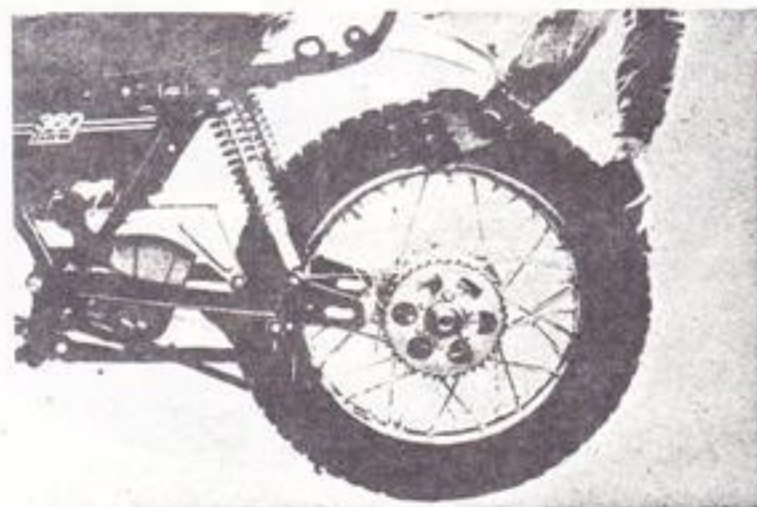


Fig 5-2-9

Replacing Tires

1) Removal

- a. Remove the valve cap and lock nut (12 mm.) from the tire valve, and deflate the tire.
- b. Loosen the bead spacer lock nut (10 mm.) Two bead spacers are provided for the rear wheel, and one for the front wheel.
- c. Twist the bead spacer until it slips off the edge of the wheel rim.
- d. Remove the tire from the wheel rim by the use of two tire levers. (Exercise care to avoid damaging the inner tube with the levers.)
It is noted that to remove the inner tube, one side of the tire should be pried over the wheel rim.

2) Installation

- a. Pull the bead spacer toward the wheel rim flange.
- b. Replace the tube between the tire and the wheel rim, and half inflate the tube. Be sure that the valve stem is directed toward the wheel shaft. Install the tube in over the same side of the rim that the tube is removed from.
- c. Mount the tire on the wheel rim by the use of tire levers. For this operation, it is advisable that the bead on one side of the tire be pushed in toward the rim flange.
- d. To avoid pinching the tube between the tire and the rim, tap the tire with a hammer.
- e. Tighten the bead spacer lock nut.
- f. Tighten the tire valve lock nut, and inflate the tire to the recommended pressure, then install the valve cap.

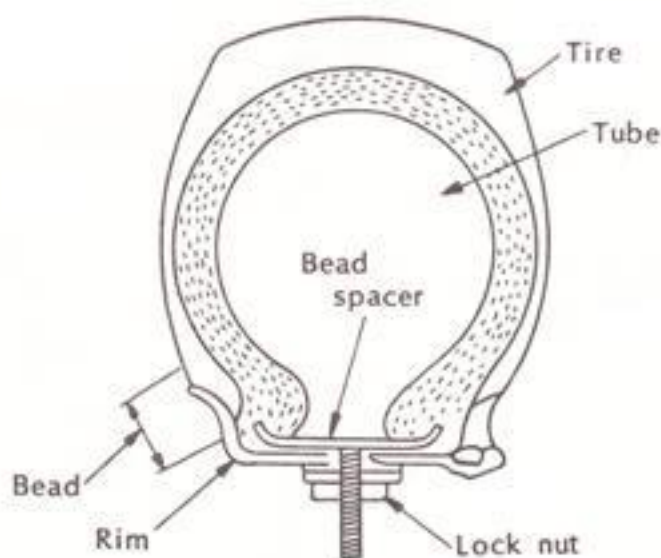


Fig. 5-2-11

2. Inspection

- 1) Run out of the rim
Check the rim for run out in the same way as the front wheel. Maximum limit of run out..... 2 mm. (0.07 in.) or less.
- 2) Brake shoe
Check the brake shoe in the same way as the front wheel. Minimum limit140 mm.(5.75 in.)
- 3) Brake drum
Check the brake drum in the same way as the front wheel.
- 4) The spokes are measured in the same way as the front wheel. A loose spoke should be tightened.
- 5) If the bearing has a excessive play or it does not turn smoothly, replace it.
- 6) If the tire or the pattern is worn out, replace the tire.
- 7) If the lip of the oil seal is damaged or warped, replace it.

5-3 Rear Wheel Sprocket

A. Removal

- 1) Removing the sprocket
 - a. Bend the lock washer ears flat.



Fig. 5-3-1

- b. Remove the sprocket mounting bolts.



Fig. 5-3-2

B. Checking

1) Checking

Check the lock washer and hexagonal bolt for breakage and damage. If the lock washer is not bent over the hexagon bolt head or broken, or if the bolt is loose, the sprocket can become loose. Make sure that both lock washers and the mounting bolts are tight.

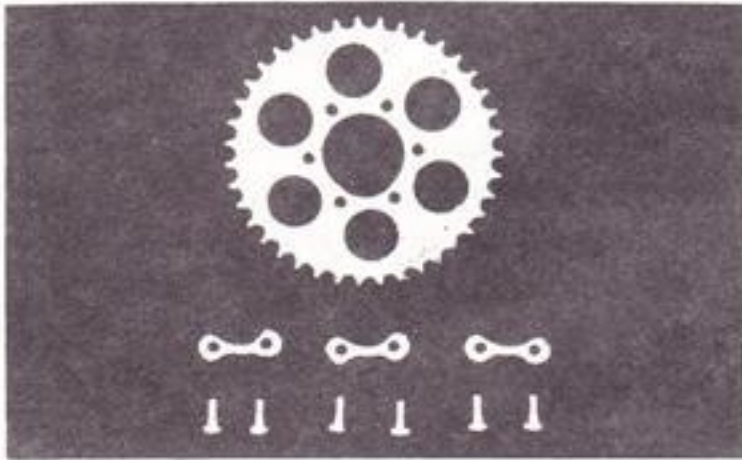


Fig. 5-3-3

5-4 Tires and Tubes

1) Normal tire pressure

Thought tire pressure is the rider's choice the standard tire pressure is as follows.

a. On-the-road riding

Front.....13 lbs./in² (0.9 kg./cm²)

Rear.....16 lbs./in² (1.1 kg./cm²)

b. Off-the-road riding

Front.....8.5 lbs./in² (0.6 kg./cm²)

Rear.....10 lbs./in² (0.7 kg./cm²)

5-5 Front Forks

The DT1-E is equipped with competition designed telescopic double dampening front forks. These specially designed front forks provide excellent riding comfort along with handling superiority. The maximum stroke travel is almost 7 inches (175 mm.)

The combination of fork stability and long stroke travel provides safety and handling ease for the rider over even the roughest of terrain. This front fork design also reduces weight, eases maintenance, and gives functional and attractive appearance. The simplicity and dependability of the front forks is provided by the installation of the fork spring inside of the fork tube.

1. Removal

1) Remove the front fender

The light-weight aluminum front fender is rubber-mounted on the stay.

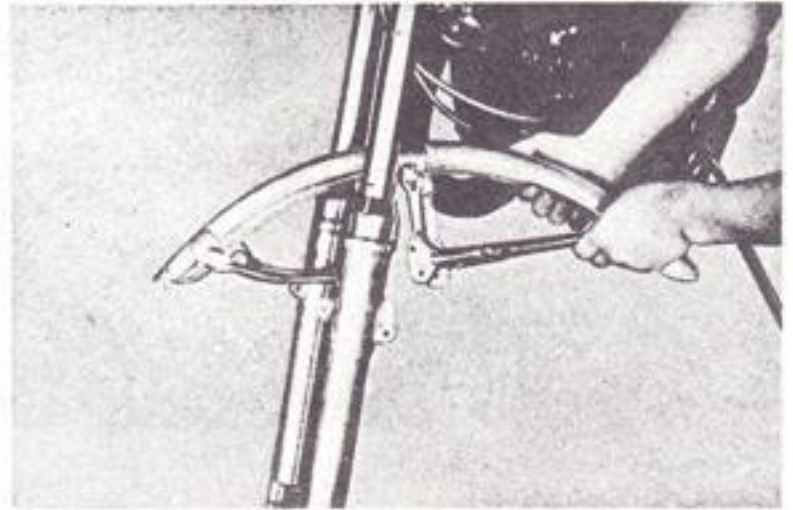


Fig. 5-5-1

2) Loosening the arrow marked bolt

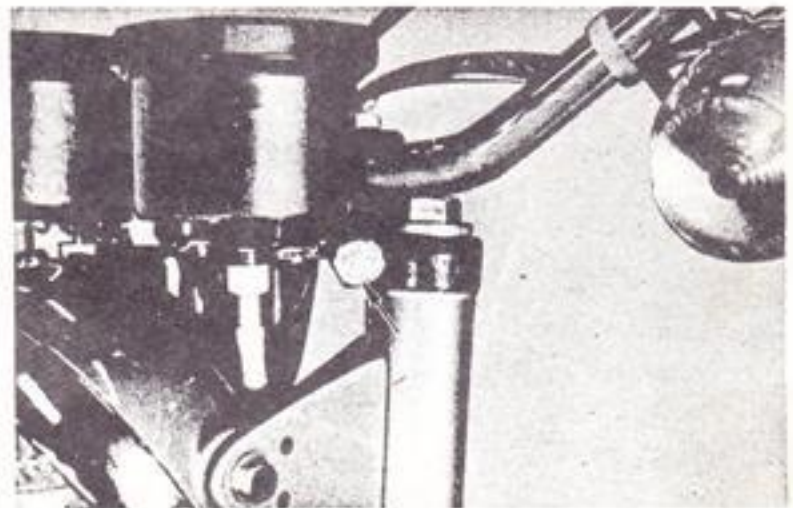


Fig. 5-5-2

3) Loosen the inner tube pinch bolts on the underbracket.

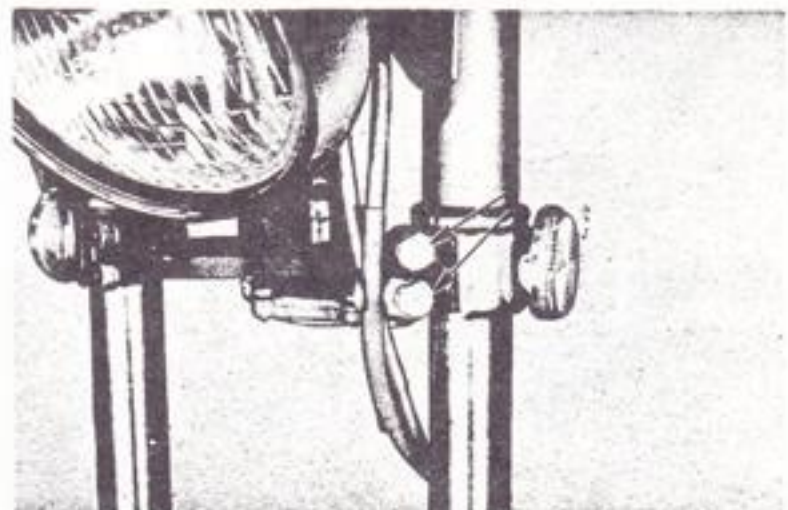


Fig. 5-5-3

4) Pull the outer tube downward.

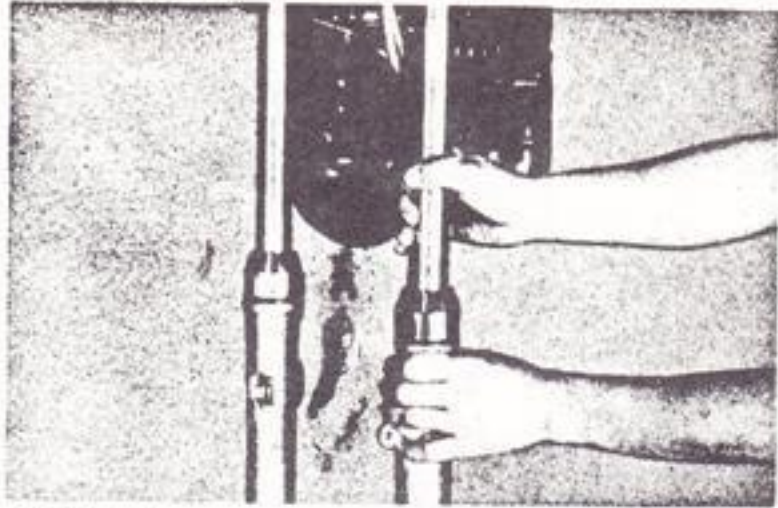


Fig. 5-5-4

3) The inner tube can be separated from the outer.

2. Disassembling the Inner and Outer Tubes

1) Drain the oil from the fork.



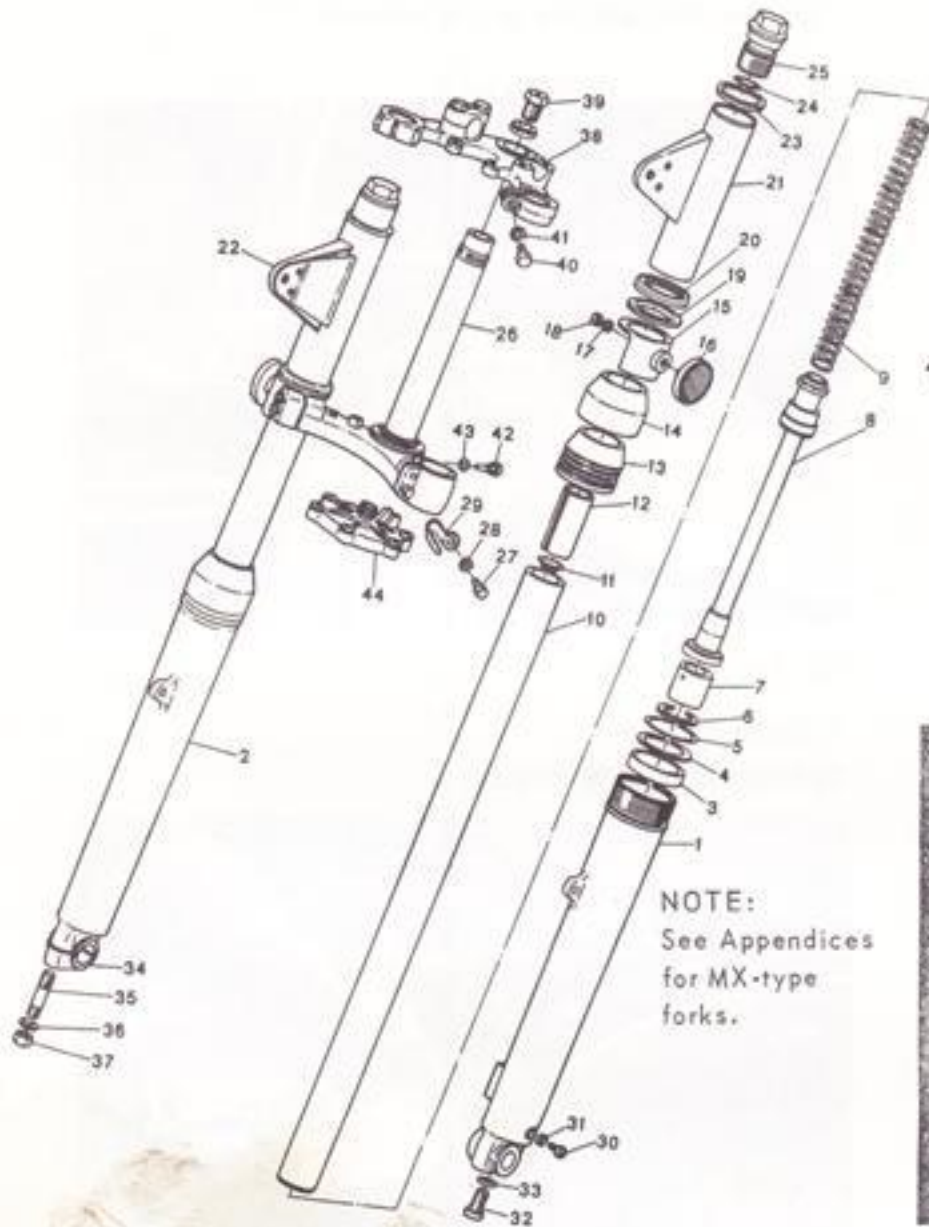
Fig. 5-5-5

2) Remove the special bolt (arrow marked) from the bottom of the outer tubes.



Fig. 5-5-6

DT1E Front Fork Exploded View



NOTE:
See Appendices
for MX-type
forks.

- | | |
|-------------------------|----------------------------|
| 1. Tube, outer left | 23. Guide, cover upper |
| 2. Tube, outer right | 24. Packing |
| 3. Oil seal | 25. Bolt, cap |
| 4. Washer, oil seal | 26. Under bracket comp. |
| 5. Clip, oil seal | 27. Bolt, under bracket |
| 6. Circlip | 28. Washer, spring |
| 7. Piston | 29. Holder, wire |
| 8. Cylinder comp. | 30. Plug, drain |
| 9. Spring, fork | 31. Gasket, drain plug |
| 10. Tube, inner | 32. Bolt |
| 11. Seat, spring upper | 33. Packing |
| 12. Spacer | 34. Holder, axle |
| 13. Seal, dust | 35. Bolt, axle holder |
| 14. Cover, dust seal | 36. Washer, spring |
| 15. Cover, outer | 37. Nut |
| 16. Reflector | 38. Crown, handle |
| 17. Washer, spring | 39. Bolt, steering fitting |
| 18. Nut | 40. Bolt |
| 19. Packing (lamp stay) | 41. Washer, spring |
| 20. Guide, cover under | 42. Bolt |
| 21. Cover, upper left | 43. Washer, spring |
| 22. Cover, upper right | 44. Handle damper ass'y |

Fig. 5-5-9

3. Checking

1) Inner tube

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

2) Oil seal

When disassembling the front fork, replace the oil seal in the outer tube nut.

4. Assembling

1) For assembling the front fork, reverse the order of disassembling. Check if the inner tube slides in and out smoothly.

2) Installing the front fork on the frame.

a. Bring up the front fork to the correct position and tighten the under bracket mounting bolt.

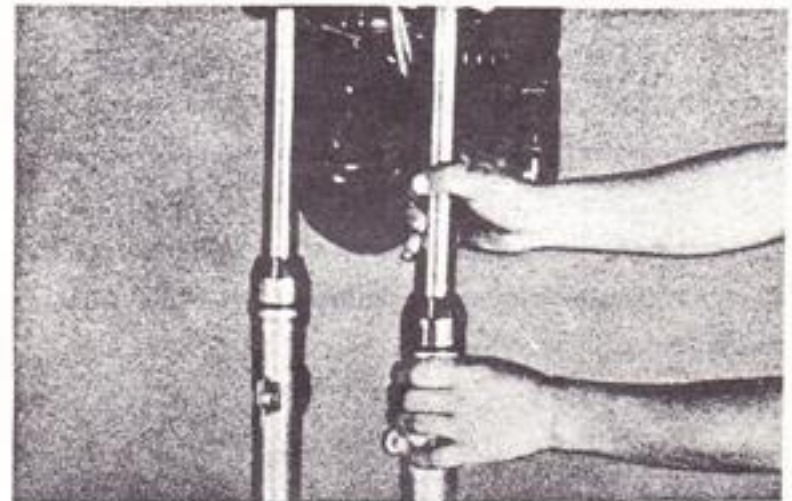


Fig. 5-5-10

b. Pour oil into the inner tube through the upper end opening. Front fork oil: Motor oil SAE 10W/30 175 c.c. (5.9 oz.) per fork leg.

c. Install the cap bolt.

5-6 Rear Shocks

The rear shocks have a maximum stroke of 90 mm. (3.54 in.) The rear cushion features superb damping and 3-position adjustable springs, that allow the rider to adjust the rear shocks to suit any riding condition.

1. Checking the Condition of the Damping Units.

- 1) Remove the rear shock assembly.



Fig. 5-6-1

- 2) Compress the shocks by applying weight as shown in Fig. 5-6-2, and release it.

If the shock quickly restores half-way and then slowly returns to the original position after it reaches 10 mm. (3/8 in.) before the original position, the rear shocks are in good condition. But if the cushion returns quickly to the original position, check the cushion for oil leakage, and replace the assembly if the oil leaks.



Fig. 5-6-2

1) Removing

- 1) Set the petcock lever at "Stop" position and disconnect the fuel line at the petcock.

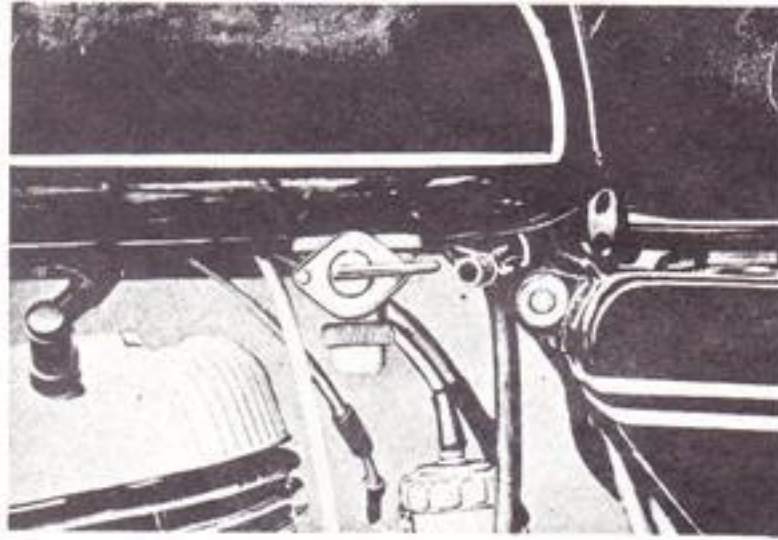


Fig. 5-7-1

- 2) Open the seat.
- 3) Remove the rubber band.

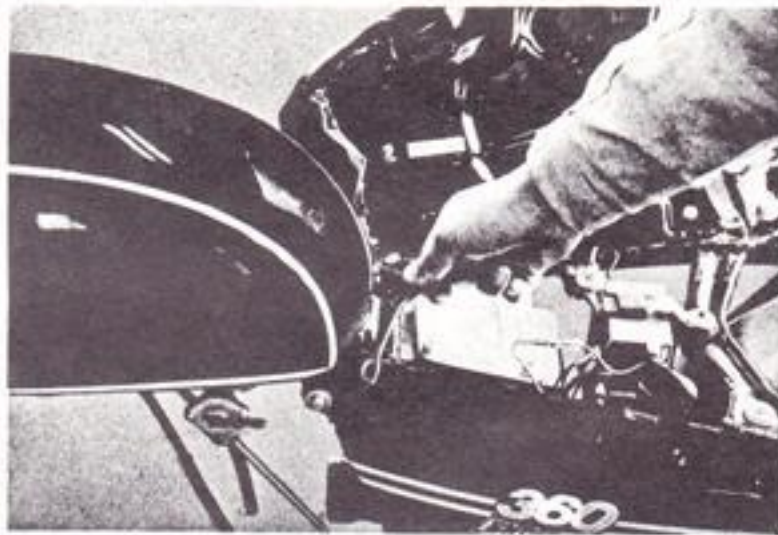


Fig. 5-7-3

5-7 Gas Tank

The gas tank has been shaped so that the rider can freely change his riding position. The front of the tank slips into the tank stay and the rear is held by rubber band. Tank capacity 9.5 litres (2.5 gals.)

- 4) Remove the gas tank.



Fig. 5-7-4

5-8 Rear Swing Arm

The rear swing arm is made of steel tube that improves the strength and torsional rigidity. The pivot employs permanent lubrication bearings.

1. Removing

- 1) Remove the chain case mounting bolts.

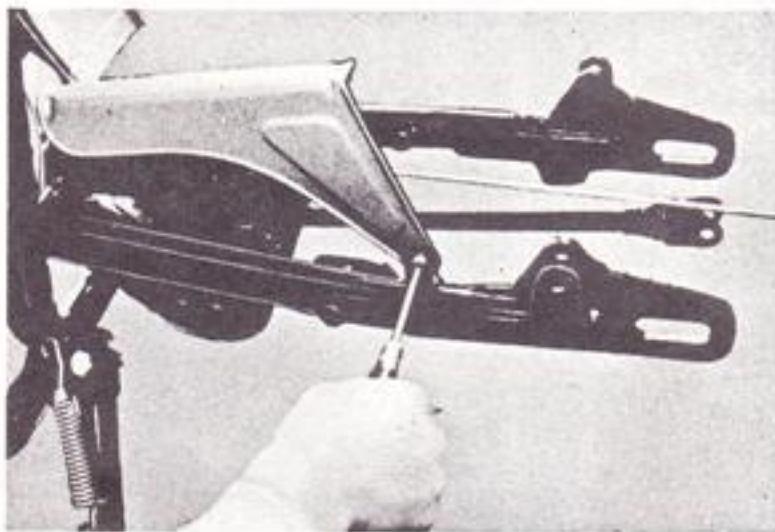


Fig. 5-8-1

- 2) Remove the rear swing arm shaft nut, pull out the shaft, and remove the rear swing arm.

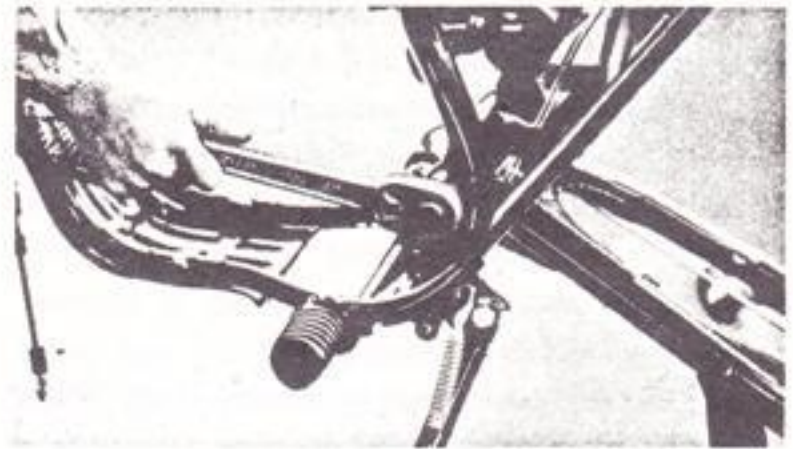


Fig. 5-8-2

2. Checking

- 1) Check the play of the rear swing arm by shaking it from side to side as shown in Fig. 5-8-3, with the rear swing arm installed. If the play is excessive, replace the rear swing arm bushings or the rear swing arm shaft.

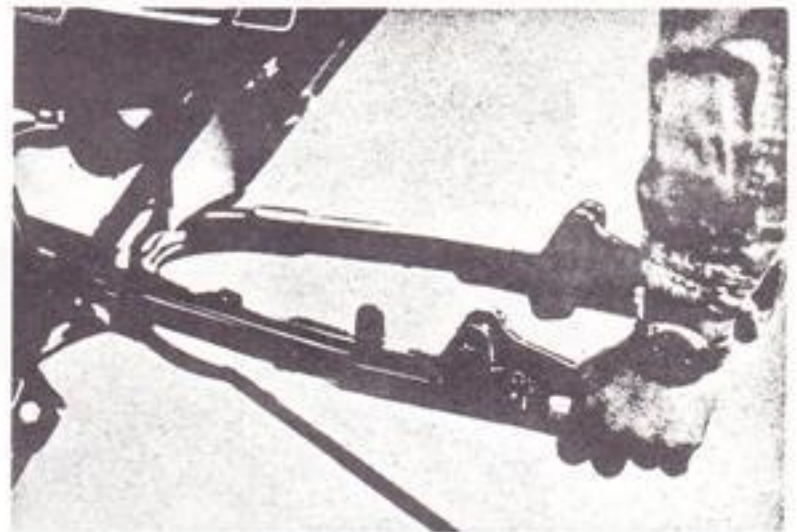


Fig. 5-8-3

- 2) Insert the bushing as indicated in Fig. 5-8-4, and check it for play. If the play is excessive, replace the bushing.

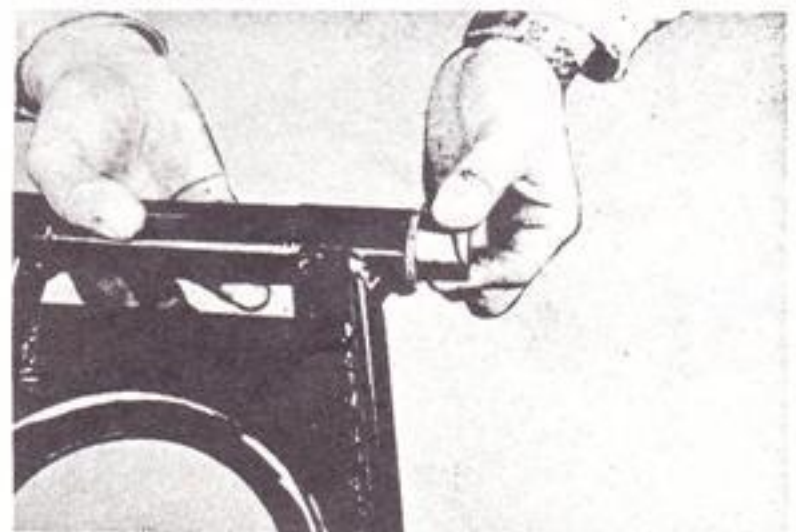


Fig. 5-8-4

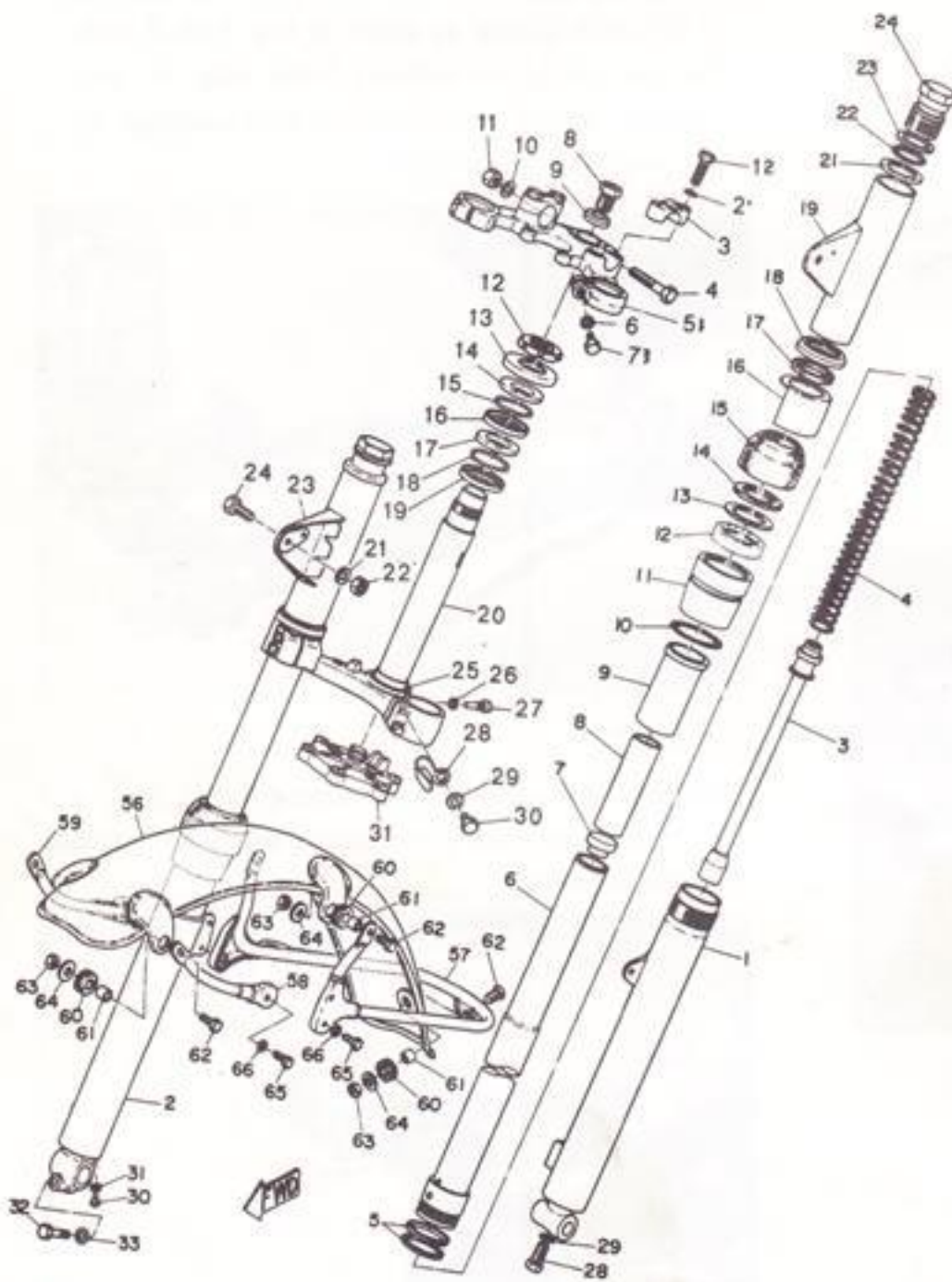
3) Grease the rear arm shaft periodically.

Replacing Rear Swing Arm Bushings

On motorcycles being habitually used for on-the-street riding, rear swing arm bushings should be replaced every 10,000 km. (6,000 miles.) The same may not apply to those used for racing or rough riding. Replacement should be made according to machine condition such as excessive play of the rear swing arm, or hard steering (wander, shimmy or rear wheel hop.) or upon request of the customer.

5-9 Steering Head

1. Sectional View of the Steering Head



- 1. Bolt
- 2. Spring washer
- 3. Handle upper holder
- 4. Bolt
- 5. Handle crown
- 6. Spring washer
- 7. Bolt
- 8. Steering fitting bolt
- 9. Crown washer
- 10. Spring washer
- 11. Crown nut
- 12. Fitting nut
- 13. Ball race cover
- 14. Ball race (2)
- 15. Ball ($\frac{3}{16}$ " x 22 pcs)
- 16. Ball race (1)
- 17. Ball race (2)
- 18. Ball ($\frac{1}{4}$ " x 19 pcs)
- 19. Ball race (1)
- 20. Under bracket complete
- 21. Spring washer
- 22. Nut
- 23. Upper cover
- 24. Bolt
- 25. Dust seal
- 26. Spring washer
- 27. Bolt
- 28. Wire holder
- 29. Spring washer
- 30. Bolt
- 31. Oil damper

Fig. 5-9-1

2. Checking

1) Ball Races and Steel Balls

Check the ball races and steel balls for pitting or wear. Check them very carefully if the machine has been in long use. If they are worn or cracked, replace all of them because defective ball races or steel balls adversely affect the maneuverability of the machine. Replace any ball race having scratches or streaks resulting from wear. Clean and grease the balls and races periodically.

Note: Do not use a combination of new balls and used races or vice versa. If any of these are found defective, replace the whole ball and race assembly.

5-10 Oil Tank, Battery Box and Tool Box

The oil tank is located on the left side under the seat. It is designed to be as narrow as possible so that it will not contact the rider's lower limbs when he stands upright on the footrests. To fill the autolube oil tank, lift the seat and the tank cap will be exposed. Oil tank capacity.....1.6 litres. (1.7 qts.)

The battery box and the air cleaner case is located right under the seat.

5-11 Frame

The double cradle-type frame is made of high tension steel tubes that provide strength, rigidity and light weight. Other dimensional features include higher ground clearance, narrower width, and longer wheel-base.

The engine is bolted to the frame at four positions. The caster is measured at 60.50°

5-12 Handlebars

The upswept type longer handlebars are ideal for motocross events and are provided with deep-cut pattern grips to prevent hand slippage. The lever holder is provided with an adjusting screw for the play of clutch cable and brake cable.

The meter bracket is mounted on the ends of the handle crown, to carry the speedometer on its left side and the tachometer on its right side.

5-13 Miscellaneous

The footrest is made of a single steel tube extending under the lower part of the frame, and bolted to the frame. The engine guard is bolted to the frame to protect the entire crankcase.....covering from the exhaust system to the drain plug.

Chapter 6 Electrical System

6-1 Construction

The Yamaha DT1-E Electrical System is designed to facilitate lightweight, functional operation and simplicity.

Yet with these features, the Ignition System and Lighting System facilitate 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 size to insure sufficient night riding visibility.

6-2 Table of component Parts

Parts	Manufacturer	Model & Type
Flywheel magneto Spark plug	Mitsubishi Elec. NGK	FZA-IBL B-8ES
Headlight Speedometer Tachometer Handle switch	Koito Mfg. Nippon Seiki Nippon Seiki Asahi Denso	6V. 35W/35W ACS
Main switch Ignition coil Horn	Asahi Denso Mitsubishi Elec. Nikko Kinzoku	TIM HP-E MF-6
Battery Rectifier Fuse	Nippon Battery Mitsubishi Elec. Osachi Mfg.	MV1-6D DS10HJ1 10A
Stop switch	Niles. Parts	SH40E
Taillight	Stanley Elec.	6V. 5.3W/17W

6-3 Connection Diagram

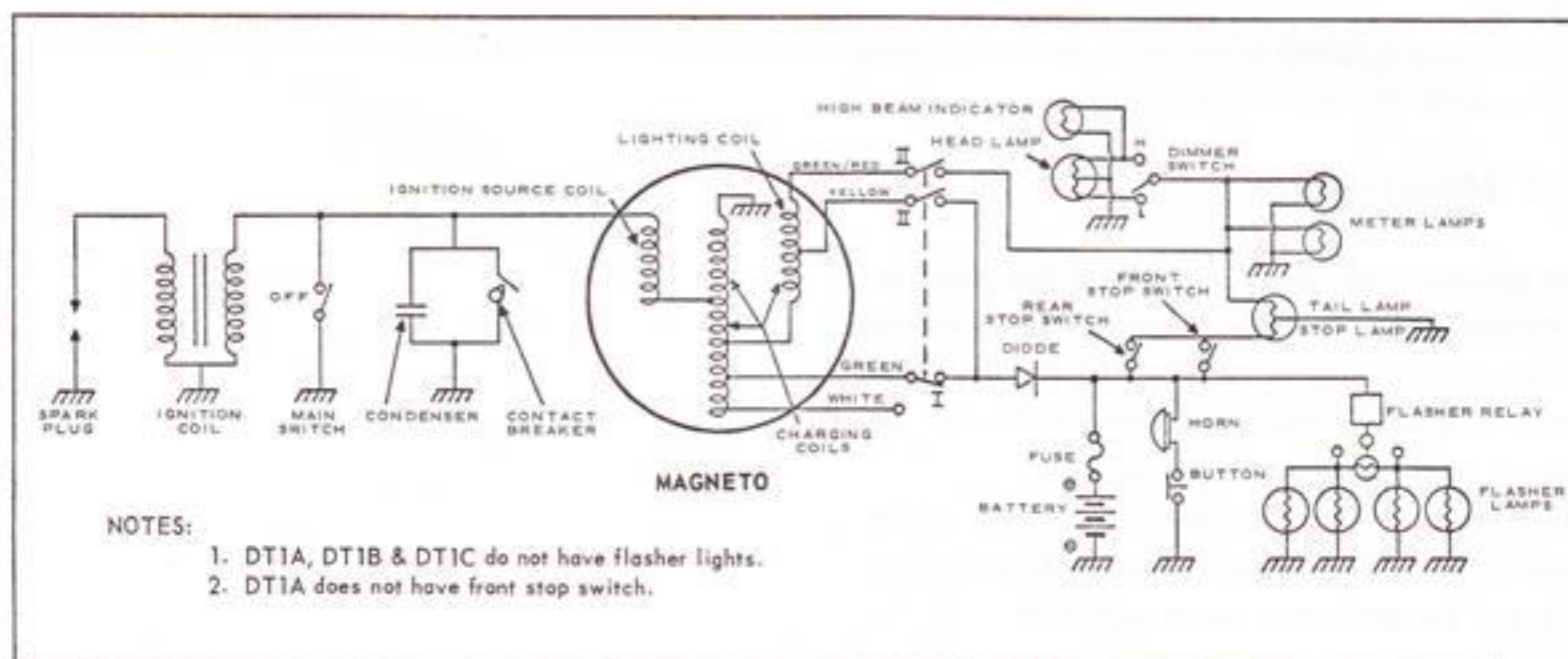


Fig. 6-3-1

6-4 Ignition System—Function and Service

1. Function

The ignition system consists of the components as shown in Fig 6-4-1. As the flywheel rotates, the contact breaker points begin to open and close alternately. This make-and-break operation develops an electromotive force in the ignition power source coil, and produces a voltage in the primary coil. The

ignition coil is a kind of transformer, with a 1:50 turn 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 the electric spark jumps across the spark plug electrodes.

Ignition Timing 3.2 mm B T D C

Maximum ignition point gap 0.3 to 0.4 mm
(0.012" - 0.015")

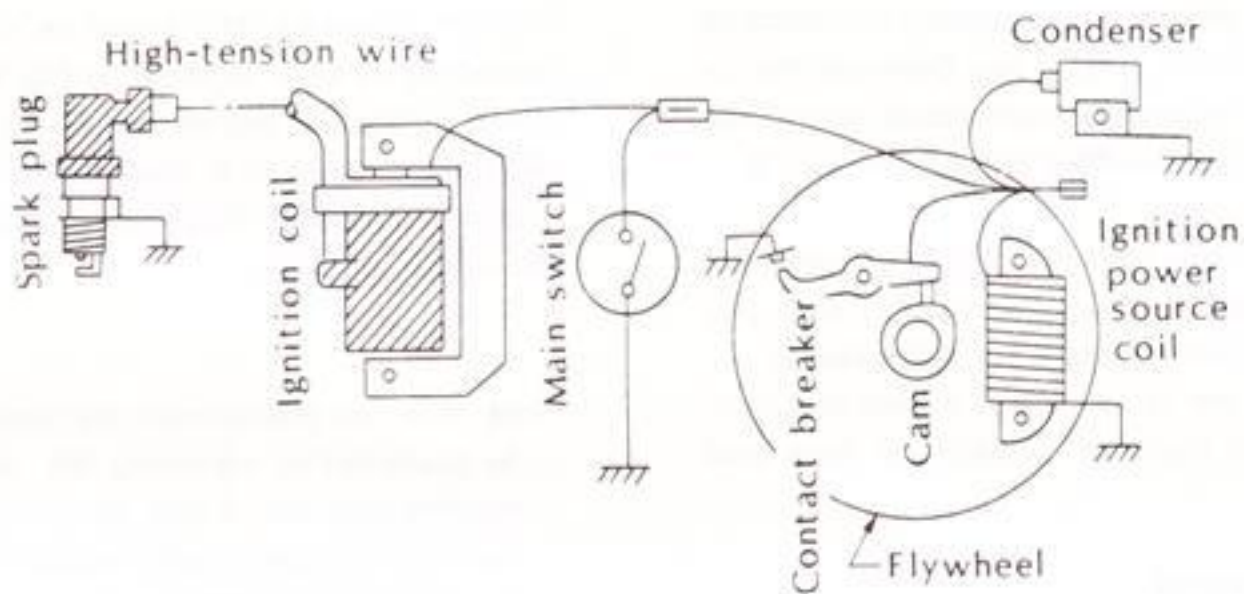


Fig 6-4-2

6-5 Ignition Timing

The DT1-E cylinder head studs and cap nuts are of a different design because of the size and function of the cylinder. The cap nuts used have a large diameter and therefore a special adaptor is required to facilitate use of the dial indicator for ignition timing on the standard model. The cylinder head must be removed and the special dial indicator adaptor attached to the dial indicator stand.

The piston should be brought to T D C and the dial indicator set at this position. The crankshaft should then be turned in reverse and the piston brought down below 3.2 mm below T D C. The flywheels should then be rotated forward until the piston reaches 3.2 mm below T D C. At this point the ignition points should just be opening. A low resistance point checker (100 Ohms or less) should be used to determine an opening and closing position of the ignition points.

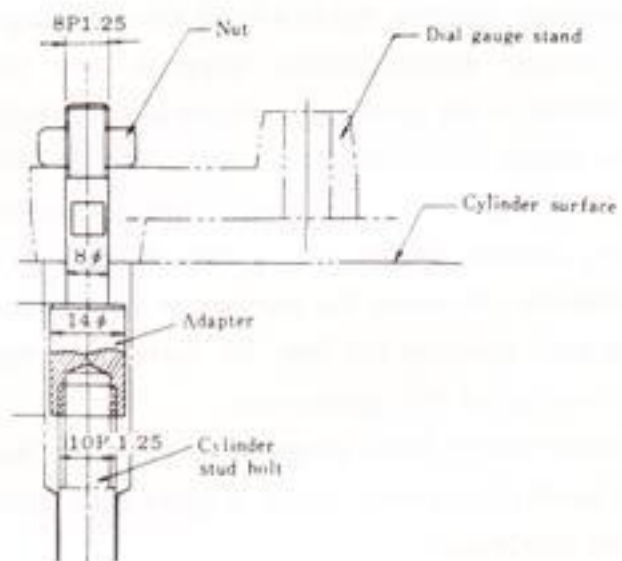


Fig 6-5-1

6-6 Ignition Coil

Primary coil resistance value.....
 $0.6 \Omega \pm 10\%$ (20°C or 68°F)

Secondary coil resistance value.....
 $5.8K \Omega \pm 10\%$ (20°C or 68°F)

(For measuring methods, refer to Fig. 6-6-1)

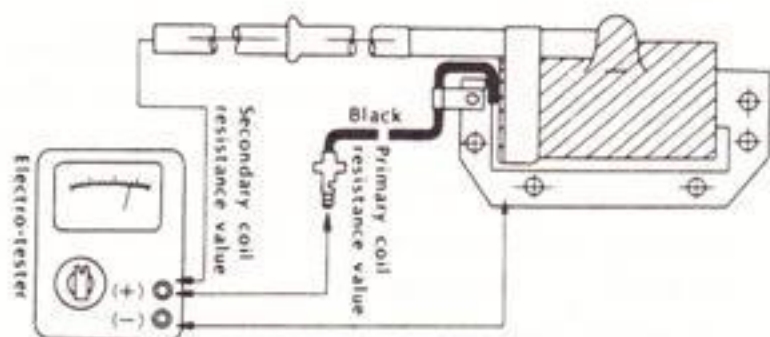


Fig. 6-6-1

Note: When measuring the secondary coil resistance value, disconnect the plug cap. Otherwise, the resistance of the 5KΩ noise suppressor incorporated in the plug will be added to the tester reading.

Spark Test:

Remove spark plug from cylinder head and reconnect the high voltage lead. Then ground the spark plug and see if it sparks as you crank the kickstarter. If it sparks 7 mm. or so and has a white blue color, the ignition coil should be considered to be in good condition.

6-7 Condenser

The condenser instantly stores a static electric charge as the contact breaker points separate, and the energy stored in the condenser discharges instantly when the points are closed. If it were not for the condenser, an electrical charge would be across the separating contact points, causing them to burn.

The condenser minimizes the burning of the contact points, greatly affecting the flow of current in the primary winding of the ignition coil.

If the contact points show excessive wear, or the spark is weak (the ignition coil is in good condition), check the condenser.

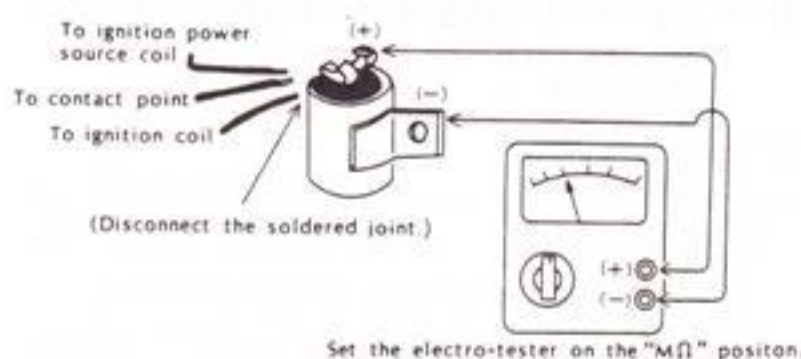


Fig. 6-7-1

Insulation resistance tests should be conducted by connecting the tester as shown in Fig 6-7-1. If the pointer swings fully and the reading is more than 3MΩ, the insulation is in good condition. If the insulation is punctured, the pointer will stay pointing the uppermost reading.

Note: After this measurement, the condenser should be discharged by connecting the positive and negative sides with a thick lead wire.

Capacity tests can be performed by simply setting the tester to the condenser capacity. The tester should be connected with condenser in the same way as in the case of the insulation resistance test. Before this measurement, be sure to set the tester correctly.

If the reading is within 0.22μF±10%, the condenser capacity is correct.

6-8 Charging System

The charging system consists of the fly wheel magneto (charging and lighting coils) rectifier, and battery.

1. Flywheel Magneto

As the flywheel rotates, an alternate current is generated in the charging and lighting coils and converted to a half-wave current by means of a silicon rectifier. This half-wave current charges the battery.

Charging Capacity (Daytime.)

- Green lead: Charging begins at 2,500 r.p.m.
- 2.0 A or less at 8,000 r.p.m.
- White lead: 0.15 A or more at 2,500 r.p.m.
- 4.0 A or less at 8,000 r.p.m.

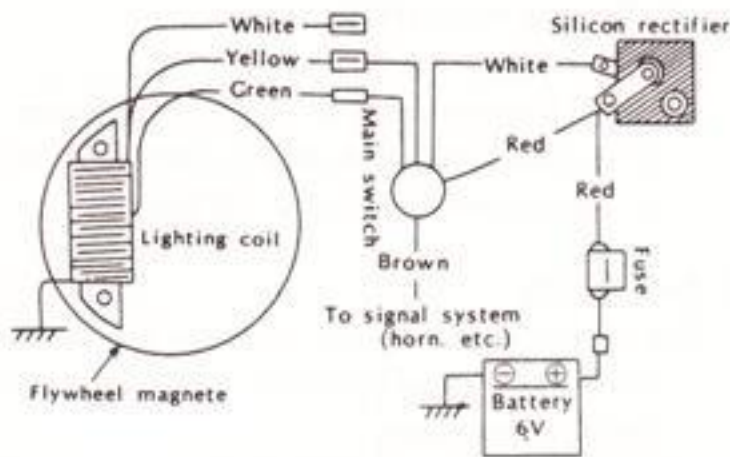


Fig. 6-8-1

Lighting Capacity (Night time)
(with normal loads and normal wiring)
5.8 V or more at 2,000 r.p.m.
8.5 V or less at 8,000 r.p.m.

- * The charging and lighting capacity is obtained when the battery is fully charged. If the battery is in a low state of charge and low in voltage, the charging rate will not be exactly the same as above. However, it is desirable that the figures are as close as possible.

2. Silicon Rectifier

The alternate current, which is generated by the flywheel magneto, is rectified and charged to the battery. For this rectification, a single-phase halfwave silicon rectifier is employed.

Characteristics: Rated output—4A,
Rated peak inverse voltage 400V

Polarity:

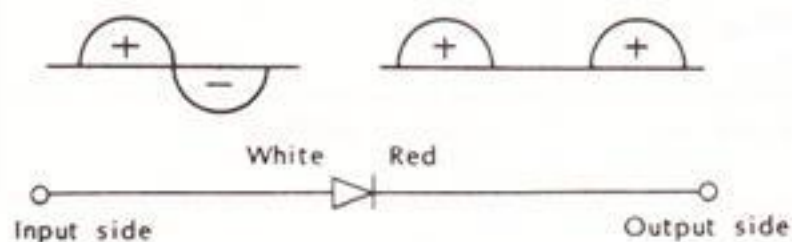
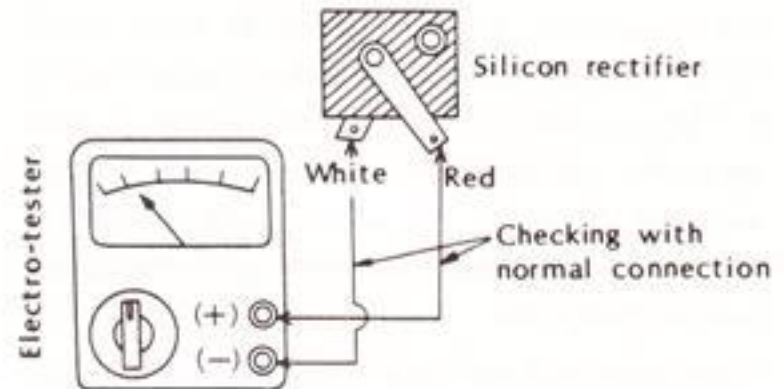


Fig. 6-8-2

1) Checking the Silicon Rectifier

For measurements, an ohmmeter can be used. However, this section discusses only the checking method by means of the ohmmeter.



(Set the tester on "Resistance.")

Fig. 6-8-3

Checking with Normal Connection

Connect the tester's red (+) to the silicon rectifier's red terminal, and connect the tester's black lead (-) to the rectifier's white terminal.

Standard value: 9–10Ω

If the tester's pointer will not swing back over from the scale, the rectifier is defective.

Checking with Reversed Connection

Connect the tester the other way around.

Standard value: If the pointer will not swing, the rectifier is in good condition.

If the pointer swings, the rectifier is faulty.

3. Operational Note

The silicon rectifier can be damaged if subjected 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.

6-9 Battery

The battery is a 6 volt—2 AH unit that is the power source for the horn, taillight, flasher light and stoplight. Because of the fluctuating charging rate due to the difference in engine R.P.M.s, the battery will lose its charge if the horn and stoplight are excessively used. The charging of the battery begins at about 2,500 R.P.M. Therefore, it is recommended to sustain engine R.P.M.s at about 2,500 to 3,500 R.P.M. to keep the battery charged properly. If the horn and stoplight are used frequently the battery water should be checked regularly as the continuing charging will dissipate the water.

If the battery will not retain a charge (and the battery is in good condition) the white wire of the flywheel magneto can be connected to the green wire of the wiring harness. This will increase the charging rate but if the machine is ridden for long periods of time with this wiring connection, the battery can be overcharged and damaged.

1) Checking

- 1) If sulfation occurs on plates due to lack of the battery electrolyte, will show and white accumulations the battery should be replaced.
- 2) If the bottoms 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.

- * The voltage will not rise to a specific value even after long hours charging.
- * No gassing occurs in any cell.
- * The 6 V battery requires a charging current of more than 8.4 volts in order to supply current at a rate of lamp per hour for 10 hours.

2. 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 re-filling the battery with electrolyte.
- 2) Battery being left discharged.
- 3) Overcharging by rushing charge.
- 4) Freezing.
- 5) Filling with water or sulfuric acid containing impurities when re-filling the battery.

3. Storage

If any motorcycle is not going to be 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 chargers.

- 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 mounting it on the motorcycle.

4. Service Standards

Battery: MV 1-6D (Nippon Battery)

Battery Spec.	6V-2AH	
Electrolyte-Specific gravity and quantity	1.26-1.27, 110 c.c.	At full charge
Initial charging current	0.2 A for 25 hours	Brand new motorcycle
Charging current	0.2 A for 13 hours (Charge until specific gravity reaches 1.26-1.27)	When discharged
Refilling of electrolyte	Distilled water up to the max. level line.	Once a month

6-10 Checking the Main Switch

(removed from the chassis)

Key "O" position (Off)
Black Switch body

Key "I" position (for day)
Green ↔ White
Red ↔ Brown

Key "II" position (for night)
Yellow ↔ White
White ↔ Blue
Red ↔ Brown

If the readings on the above six measurements are nearly 0Ω , and no short-circuit is noticed between the terminals, as well as between the lead terminal and the switch body, the main switch is in good condition.

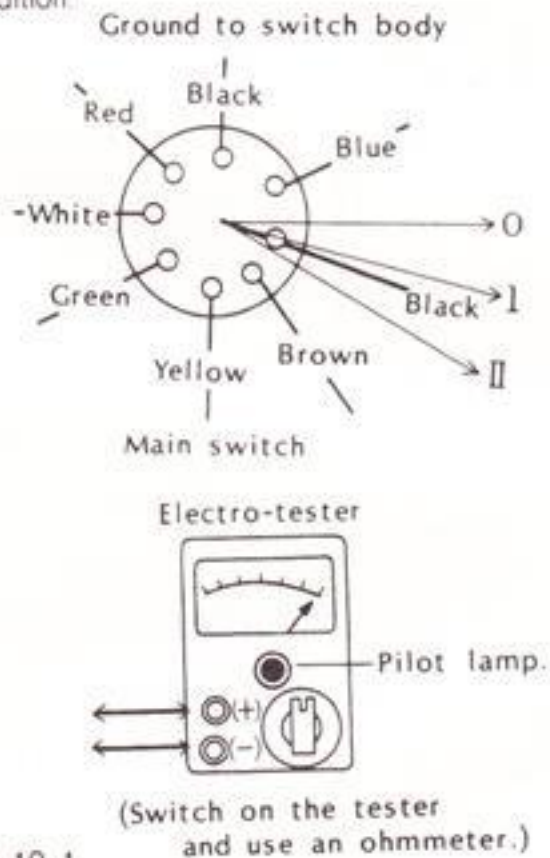


Fig 6-10-1

6-11 Spark Plug

The life of a plug and its discoloring vary, according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with suitable ones according to 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 accordingly.

It is actually economical to install new plug every 3,000 km (2,000 miles) since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

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

- 1) Best..... When the porcelain around the center electrode is a light tan color.
- 2) If the electrodes and porcelain are black and somewhat oily, replace the plug with a hotter-type for low speed riding.
- 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.

2. Inspection

INSTRUCT THE RIDER TO

Inspect and clean the spark plug at least once a month or every 1,000 km (500 miles). Clean the electrodes of carbon and adjust the electrode gap to 0.5-0.6 mm (0.023 in). Be sure to use standard B-8ES plug as replacements to avoid any error in reach.

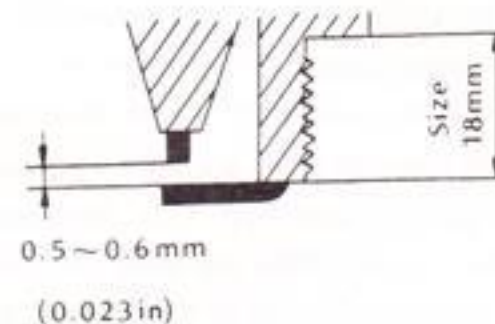


Fig 6-11-1

6-12 Lighting and Signal Systems

The lighting and signal systems consist of the horn, flasher light and stoplight (power source-battery) and the headlight, taillight, meter lamps, high beam indicator, speedometer and tachometer (power source-flywheel magnet)

1. Headlight

The headlight has two 6V, 35W bulbs, and a 6V, 1.5W high beam indicator on its top. A beam direction adjusting screw is fitted on the right side of the light rim so that the horizontal direction of the beam can be adjusted (not vertical)

2. Taillight and Stoplight

A 6V, 5.3W taillight and a 6V, 17W stoplight are mounted.

3. Horn

The horn is a 6V, flat type, and has a tone-volume adjusting nut on its back. After adjustment is made, apply paint or lacquer to the nut for water proofing purposes.

4. Speedometer

A circular type speedometer is rubber-mounted on the bracket. It has a built-in trip meter and odometer. For illumination, a 6V, 3W bulb is provided.

5. Tachometer

An independent tachometer is mounted separately from the speedometer. The revolutions per minute of the crankshaft are conveyed from the kick idler gear through the gear unit to the tachometer. The meter lamp is of the 6V, 3W type.

Note: 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. Avoid the use of a 12V bulb, because shorter service life will result. When the headlight beam switch is operated to change the beam from one to the other, the headlight is designed to keep both bulbs burning during the change-over. This is to protect other light bulbs, meter lamps, taillight, etc., from burning out as a result of turning off the headlight, though temporarily.

If one of these light bulbs burns out while the machine is running, it will overload other bulbs and shorten their service life. In this case, reduce the engine speed and replace the burnt bulb as quickly as possible.

Chapter 7 Conversion for Competition

The Yamaha Enduro 250DT1-E is easily converted into a high performance competition machine by using GYT parts.
GYT: Genuine Yamaha Tuning

7-1 List of GYT Parts

The following alternate parts for racing are available through authorized Yamaha dealers.

No.	Parts No.	Parts Name	Quantity	Remarks
1	● 214-11111-70	Head, cylinder	1	
2	▲ 94700-00016	Plug, spark	1	NGK B-10E(N)
3	● 214-11311-70	Cylinder	1	
4	● 214-11631-70	Piston	1	
5	● 214-11611-70	Ring, Piston	1	
6	● 214-14101-70	Carburetor ass'y	1	
7	▲ 161-15426-00	Cover, oil pump	1	
8	▲ 214-17819-00	Cap, housing	1	
9	● 214-17461-40	Sprocket, drive	1	14 Teeth
10	▲ 214-25446-10	Gear, sprocket wheel	1	46 Teeth
11	▲ 214-25448-10	Gear, sprocket wheel	1	48 Teeth
12	● 214-14610-70	Muffler	1	
13	● 214-14763-01	Spacer, rubber	1	
14	● 214-14764-00	Spacer, rubber	1	
15	● 214-14793-61	Plate, outer	1	
16	152-25139-00	Plug, blind	1	
17	94127-21071	Tire, front	1	2.75-21-4PR
18	94227-21031	Tube	1	◇
19	94327-21024	Band, rim	1	◇
20	94416-21038	Rim	1	◇
21	214-25196-10	Spoke, inner	1set	◇
22	214-25197-10	Spork, outer	1set	◇
23	214-25101-70	Front wheel ass'y	1set	3.25-19-4PR

- Included in GYT Kit ▲ Not included in GYT Kit
●▲ The above parts are also sold individually.

Installation of the Yamaha GYT Parts and removal of unnecessary equipment, such as lighting, quickly transforms the DT1-E Trail into a competition proven racing machine. After installation of the highly tuned GYT parts, the DT1-E engine will gain optimum output at midrange and top end.

1. Specifications (comparison of GYT Parts to standard parts.)

- 1)Cylinder Head Volume and shape of combustion chamber changed to increase top end performance Spark plug hole moved to center of the head.
- 2)Cylinder Chrome plated cylinder liner inside of aluminum cylinder body Port timing changed to increase performance Intake port diameter increase
- 3)Piston Material changed to Lowex for increased reliability One cast iron piston ring Design of piston changed to match port timing of cylinder
- 4)Carburetor Size increased to 30 mm venturi(VM 30 SH) Main jet size increased to 200
- 5)Exhaust system Tuned exhaust(expansion chamber) to give maximum performance
- 6)Spark plug Heat range and type of plug changed to B-10E(N)
- 7)Oil Pump Removed to facilitate installation of GYT cylinder

2 Check engine condition before installation of GYT Parts.

After installation of the GYT parts, the engine will be set-up for optimum output. Therefore, to insure reliability, performance, and engine safety, the critical engine components should be checked and set to recommended standards before installation of GYT parts.

- 1)Remove the engine from the frame and disassemble engine (Refer to section 5 Engine)
 - a Check the crankshaft assembly, crank bearing, connecting rod, connecting rod big end and small end bearings, and set to recommended standards or replace faulty parts as necessary
 - b Oil seals. It is suggested to replace all of the oil seals upon engine disassembly for installation of GYT parts to insure against the slightest possible leakage.
 - c Replace all gaskets and O rings upon assembly of the engine and use recommended sealant.

3. Installation of GYT Parts.

- 1) Install a cap housing cover over the tachometer drive opening in the right-hand crankcase if the tachometer is removed from the machine.
- 2) Assemble cylinder head, cylinder, and piston with new gaskets
- 3) Assemble VM 30SH carburetor with 10 mm. thick insulator on cylinder.

Carburetor Specifications

Name of Part	Abbreviation	Specifications
Main jet	M. J.	#200
Needle jet	N. J.	0-2
Jet needle	J. N.	5DP 7-3 stages
Throttle valve cut away	C. A.	3.5
Air screw setting	A. S.	1
Starter jet	G. S.	#60
Float level	F. L.	24.0 mm.(0.945 in.)

- 4) If the oil pump is removed, install an oil pump cover plate on the crankcase, installing a 6 mm bolt in the inlet hole on the cylinder intake port. Follow the oil manufacturer's recommendation for fuel/oil ratio.
A 15:1 fuel/oil ratio should be mixed in the gas tank when the Autolube pump is removed.
If the oil pump is retained, a 30:1 fuel/oil ratio could be mixed in the gas tank in conjunction with the Autolube pump.
- 5) Secondary sprocket ratio will have to be determined by the owner depending on the type of riding or competition conditions to be encountered.
The gearing should be reduced if this machine is to be raced on a short or extremely rough course. If the secondary drive sprocket is changed, be sure to bend the lock washer ears up after installation of the gear.
- 6) After installation of the GYT parts, thoroughly check the condition of the engine components. The engine should be considered in new condition. Start the engine and run between 4,000 and 5,000 R.P.M. for 5 to 10 minutes. Let the engine cool and repeat this procedure several times.
Remove the spark plug and make a reading as to the spark plug heat range, main jet size and jet needle position. Adjust as necessary and take the machine for a trial run. Remove the spark plug again and make another reading for spark plug heat range, main jet size, and jet needle position.

7-3 Addittional Modification

All of the unnecessary equipment such as lighting, mirrors, etc., should be removed if the machine is to be raced. Removal of the speedometer and/or tachometer will be optional with the rider and depend on the type of riding to be done.
Further modification, such as gear ratio, tire changes, suspension changes or modification, installation of 21 in. front wheel, etc., is part of personalization and up to the owner.

7-4 Specifications(GYT)

Piston Clearance	0.045-0.050 mm
Spark plug	Standard B-10E(N)
Ignition Timing	B T D C 2.3 mm
Secondary reduction	Chain
Carburetor setting	Main Jet #200 Needle Jet 0-2 Pilot Jet #80 Cut away 3.5 Number of turns back off air screw 1
Float level	24.0 mm (0.945 in)
Fuel Mixing ratio	If the AUTOLUBE is in use 30:1 If not 15:1
Gear Oil amount	1.000 c.c. (1.0 qt)
Oil Pump	
Minimum stroke	0.20-0.25 mm
Maximum stroke	1.85-2.05 mm

7-5 Setting the Ignition Timing

- 1) Install the dial gauge in the cylinder head.
Note: On the special racing head the spark plug hole is centered and parallel to the cylinder bore.
- 2) Roughly aligns the red mark on the rotor with the pointer attached to the stationary plate.
- 3) Check to see if the points are clean and not pitted. They can be smoothed with #400 sandpaper or with an oil stone.
- 4) Connect a tester to the points and ground so that the exact opening and closing of the points can be measured.
- 5) Rotate the rotor so that the piston will be lowered 2.3 mm B T D C. At this point, loosen the breaker plate setting. Adjust the breaker plate so that the points just close. Then tighten the breaker plate.

7-6 Check and Service Prior to Racing

The following items should be checked and serviced before racing

- 1) Check the cylinder, piston, and crankshaft ass'y for any defects.
- 2) Make sure that the carburetor is clean and correctly set.
- 3) Check ignition timing, lead wire connect on, and insulation.
- 4) Retighten screws, bolts and nuts in all parts.
- 5) Check the cables.
- 6) Clean the gas tank and petcock.
- 7) Adjust and oil the chain.

Adjust the drive chain so that it has free play of approximately 1 in (25 mm.) up and down at the center of the lower section with the rear wheel on the ground.

GAS (FUEL) TO OIL RATIO CHART

Gas/Oil Ratio	12:1	15:1	20:1	24:1	28:1	30:1	36:1	40:1
Oil (qt.) per 1 Gal. Gas	0.33	0.27	0.2	0.17	0.14	0.13	0.11	0.1
Oil (oz.) per 1 Gal. Gas	10.7	8.5	6.4	5.3	4.6	4.3	3.6	3.2
Oil (qt.) per 5 Gal. Gas	1.66	1.33	1.0	0.84	0.72	0.67	0.55	0.5
Oil (oz.) per 5 Gal. Gas	53.5	42.67	32.0	26.6	22.8	21.32	17.8	16.0

(U.S. Gallons)

TORQUE SPECIFICATIONS

Size	Kg/M	Ft.Lbs.	In.Lbs.
6mm	1.0	7	90
7mm	1.5	11	135
8mm	2.0	15	180
10mm	3.5-4.0	26-29	300-350
12mm	4.0-4.5	29-33	350-400
14mm	4.5-5.0	33-37	400-450
17mm	5.8-7.0	40-50	500-600

CONVERSION TABLES

Metric to Inch System

	KNOWN	MULTIPLIER (Rounded off)	RESULT
TORQUE	kg-m	7.235	ft-lbs
	kg-m	86.82	in-lbs
	kg-cm	.0724	ft-lbs
	kg-cm	.8682	in-lbs
WT.	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
VOL./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 × $\frac{9}{5}$) + 32	Fahrenheit (°F)

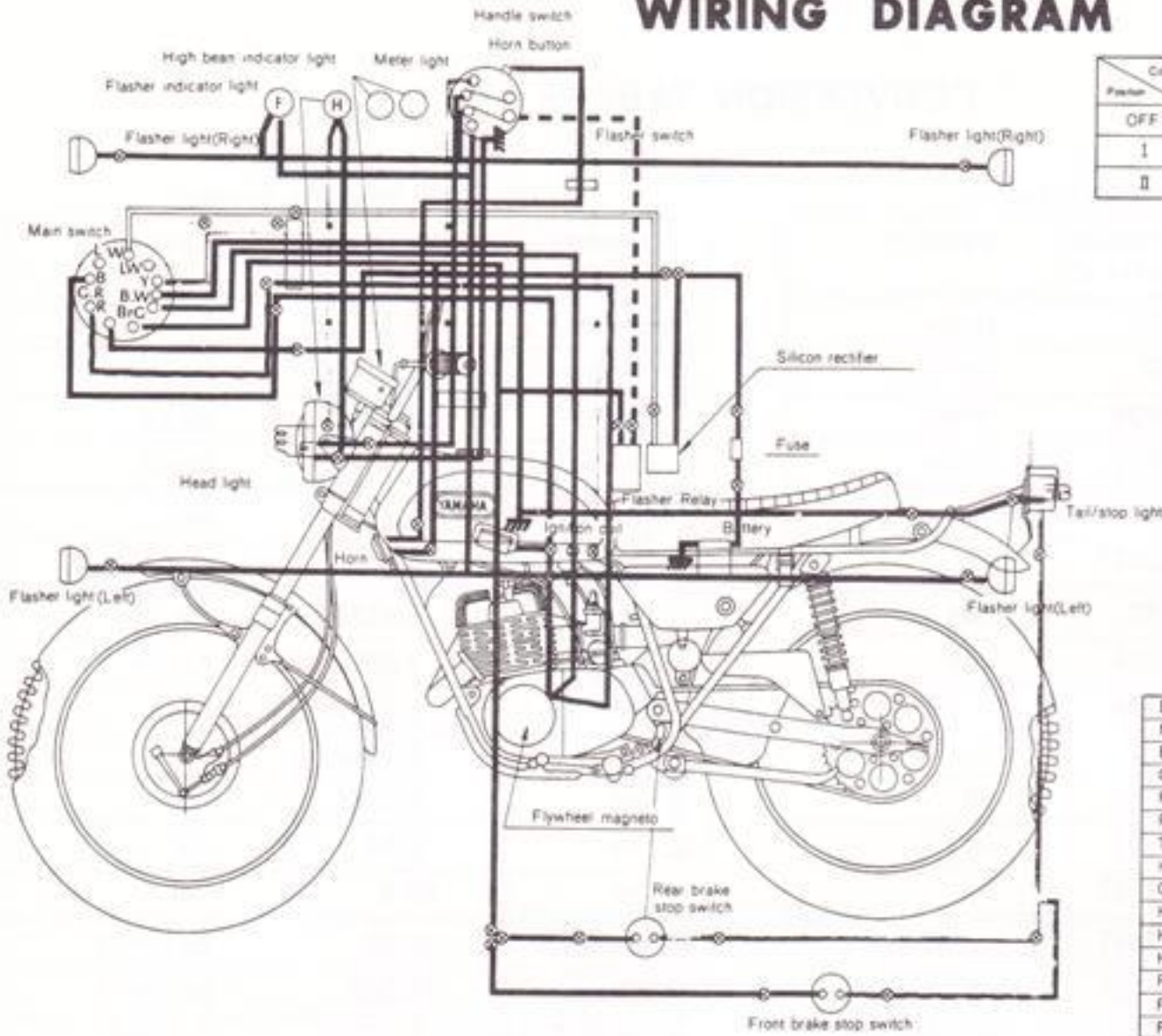
Inch to Metric System

	KNOWN	MULTIPLIER (Rounded off)	RESULT
TORQUE	ft-lbs	0.13826	kg-m
	in-lbs	0.01152	kg-m
	ft-lbs	13.825	kg-cm
	in-lbs	1.1518	kg-cm
WT.	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
VOL./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 × $\frac{5}{9}$) - 32	Centigrade (°C)

DEFINITION OF TERMS

- kg-m = Kilogram meters: 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) (cm³): Volume or capacity.
- kg/mm = Kilogram(s) per millimeter: usually spring compression rate.
- kg/cm² = Kilogram(s) per square centimeter: pressure.

DT1C - DT1E WIRING DIAGRAM

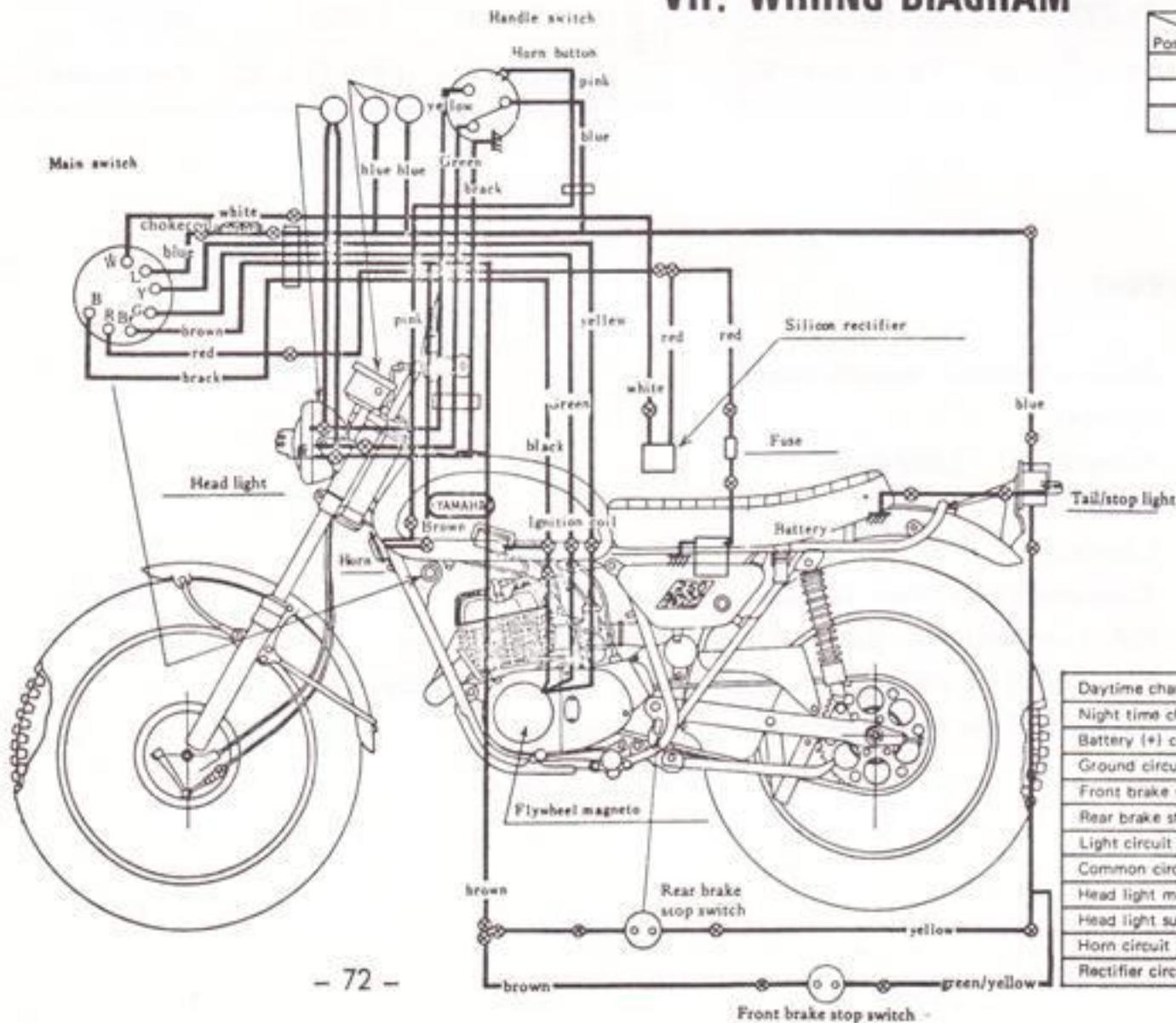


Color Position	E	B	R	Br	L	G	W	GR	LW	Y
OFF	○	○								
I			○	○		○	○			
II			○	○	○		○	○	○	○

Chart of wire colors

Daytime charging circuit	Green	——
Night time charging circuit	Green/Red	——
Battery (+) circuit	Red	——
Ground circuit	Black	——
Front brake stop light circuit	Green/Yellow	——
Rear brake stop light circuit	Yellow	——
Tail light circuit	Blue	——
Head/Meter light circuit	Blue(L, W)	——
Common circuit	Brown	——
Head light main circuit	Yellow	——
Head light sub circuit	Green	——
Horn circuit	Pink	——
Rectifier circuit	White	——
Flasher light(Right) circuit	Dark green	——
Flasher light(Left) circuit	Dark Brown	——
Flasher relay circuit	Brown/White	——

DT1A - DT1B - DT1C VII. WIRING DIAGRAM



Color Position	E	B	R	Br	G	W	Y	L
OFF	○	○						
I			○	○	○	○		
II			○	○	○	○	○	○

Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Yellow
Battery (+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Light circuit	Blue
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White

DT1A

(1968)

MODEL CHANGES

Note

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CRANK CASE

Ref No.	Parts No.	Part Name	Description	Qty	S-R	Remarks
1- 1	214-15111-00	CASE, crank (L.H.)	(DISCONT)	1		
1- 1-1	214-15111-01	CASE, crank (L.H)		1		
1- 2	214-15121-01	CASE, crank (R.H)	(DISCONT)	1		E/#2759~
1- 2-1	214-15121-02	CASE, crank (R.H)	(DISCONT)	1		E/#3383~
1- 2-2	214-15121-03	CASE, crank (R.H)	(DISCONT)	1		150
1- 2-3	214-15121-04	CASE, crank (R.H)		1		

NOTE: All pre-150 crank cases have been discontinued. All new 150 crank cases ordered will be the 150 (071B) edition. (Dtg. #15001 and up).

THESE CRANK CASES ARE INTERCHANGEABLE IF the following procedure is adhered to when ordering:

LEFT CRANK CASE HALF:

(00) Dtg. #0001-2758. Order one 214-15117-09 spacer metal for upper rear motor mount.

(01) Dtg. #2759-(Present). Interchangeability okay with 150 type. (071B) RIGHT CRANK CASE HALF:

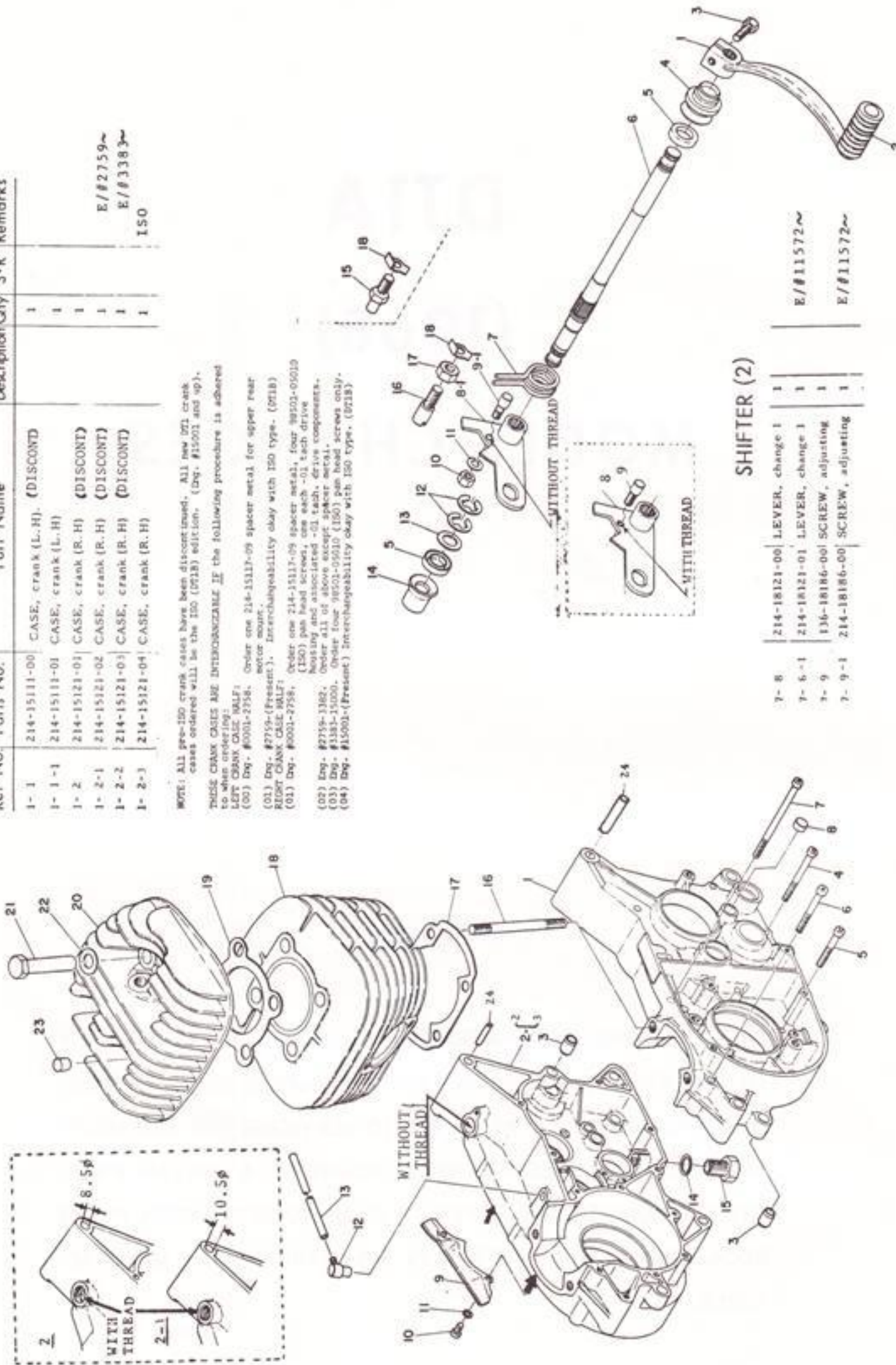
(01) Dtg. #0001-2758. Order one 214-15117-09 spacer metal, four 98501-05010 (150) pan head screws, one each -01 tach drive housing and associated -01 tach drive components.

(02) Dtg. #2759-1382. Order four 98501-05010 (150) pan head screws only.

(03) Dtg. #1585-15000. Order four 98501-05010 (150) pan head screws only.

(04) Dtg. #15001-(Present). Interchangeability okay with 150 type. (071B)

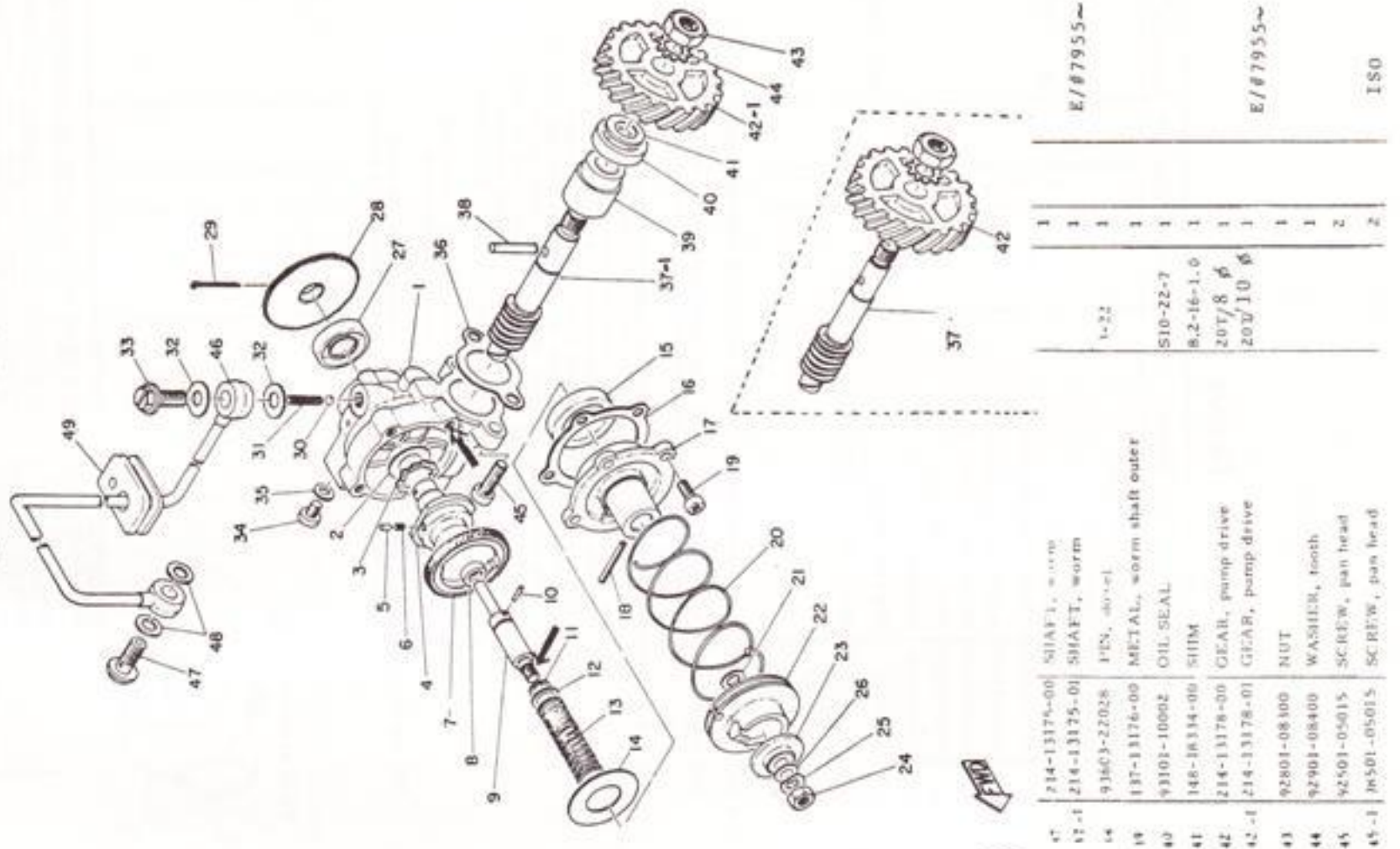
Fig. 1 CRANK CASE



SHIFTER (2)

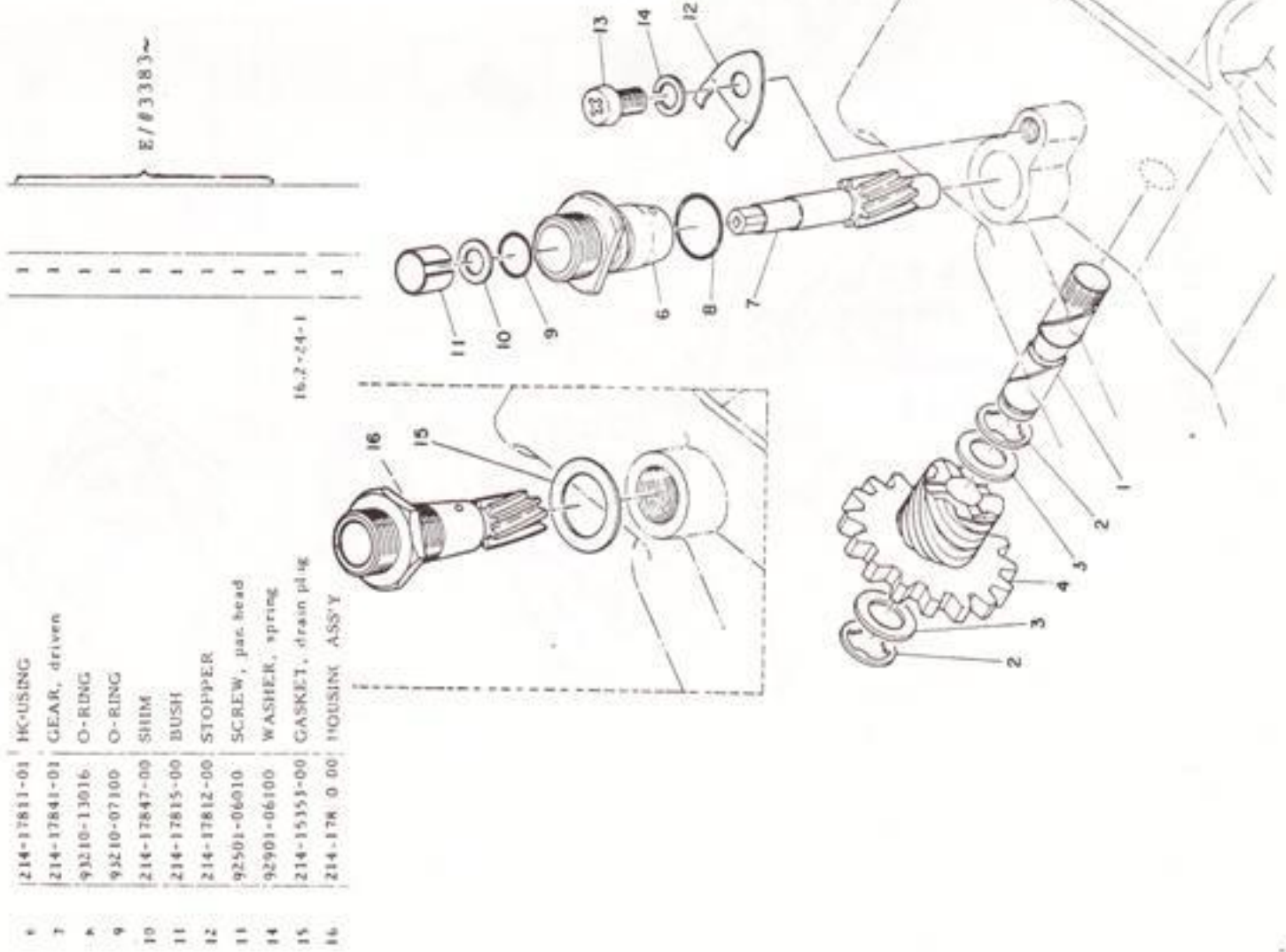
7- 8	214-18121-00	LEVER, change 1	1	E/#11572~
7- 6-1	214-18121-01	LEVER, change 1	1	E/#11572~
7- 9	136-18186-00	SCREW, adjusting	1	
7- 9-1	214-18186-00	SCREW, adjusting	1	E/#11572~

Fig. 13 OIL PUMP



1	1-22		
1	S10-22-7		E/#7955~
1	B.2-16-1.0		E/#7955~
1	20V/8 φ		
1	20V/10 φ		
1			
1			
1			
1			
2			
2			

Fig. 9 TACHOMETER_GEAR

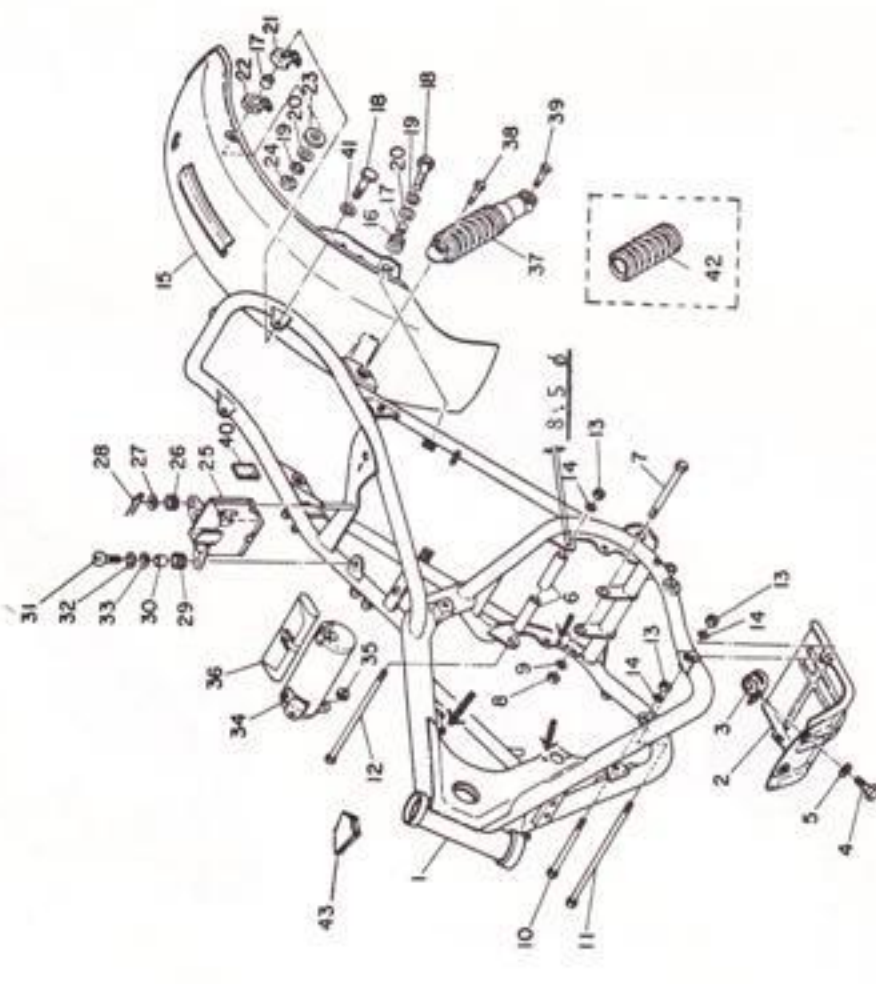


6	214-17811-01	HOUSING
7	214-17841-01	GEAR, driven
8	93210-13016	O-RING
9	93210-07100	O-RING
10	214-17847-00	SHIM
11	214-17815-00	BUSH
12	214-17812-00	STOPPER
13	92501-06010	SCREW, pan head
14	92901-06100	WASHER, spring
15	214-15351-00	GASKET, drain plug
16	214-178 0 00	HOUSING ASSY

FRAME

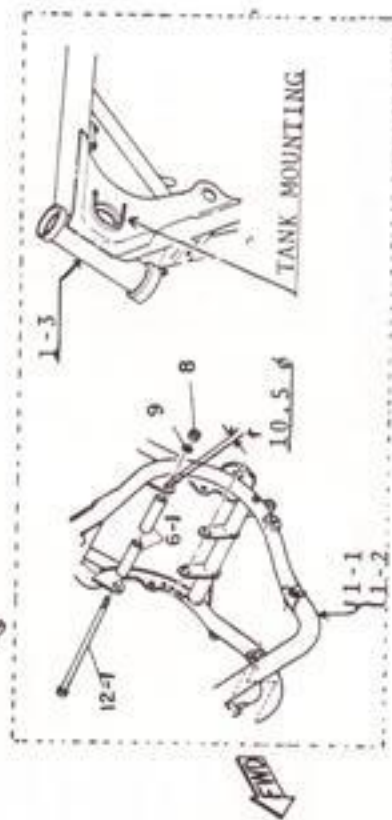
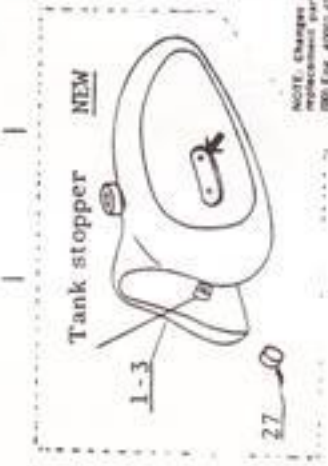
No.	Parts No.	Part Name	Description	Qty	S-R	Remarks
15	214-21746-00	DAMPER, tool box		1		
16	214-28100-00	TOOL ASS'Y		1		☆
17	214-28100-01	TOOL ASS'Y		1		☆ ISO
17	214-22210-20	PFAR CUSHION ASS'Y		2		
18	214-22241-00	BOLT, rear cushion upper		2		
19	214-22242-00	BOLT, rear cushion upper		2		
20	214-21268-00	SEAL, battery box		1		
21	92902-04200	WASHER, plain		2		
22	214-22212-10	SPRING ONLY		2		
23	214-21269-00	SEAL (TANK DRAIN)		1		K=1.56Kg/M

Fig. 15 FRAME



NOTE: Make a thorough identification on each part before ordering parts:

- (00) Eng #0001-2758. Utilized 8 mm upper rear motor mount bolt. Tap out motor mount bolt hole to 10.5mm to interchange with (01) frame.
- (01) Eng #2759-(UNKN) First change was to 10.5mm upper rear motor mount bolt hole. Interchangeability okay with (00) frame. Second change (engine number unknown) was to add rear turn signal mounts. Interchangeability still okay.
- (02) Eng # (UNKN)-13000. Went to ISO standard (Eng # unknown). Changes in this frame are the 5mm threads on the fittings for the rectifier, ignition switch, brake light switch and ignition coil mounting. To replace a (00 or 01) frame with (02), in addition to above will require purchasing the associated ISO screws for the aforementioned components.
TO IDENTIFY a (02) frame, look for the ISO dot on the heads of the mounting screws on the above components.
- (03) Eng #13001-present. Still ISO. Only change here is in gas tank mount. NOT interchangeable with (00-01-02) frames.



NOTE: Changes in the gas tank on the BTI have made it necessary to pay particular attention to Engine Numbers before ordering replacement parts.
 (00) Eng #0001-2758. Utilized 8mm fuel tank stay mounting bolt. To interchange to (01) tank enter two 91202-08013 bolts. To interchange to (02) tank enter two 91202-08013 bolts. To interchange to (03) tank enter two 91202-08013 bolts. To interchange to (04) tank enter two 91202-08013 bolts. To interchange to (05) tank enter two 91202-08013 bolts.
 (01) Eng #2759-(UNKN) Utilized 10mm fuel tank stay mounting bolt. During this period the fuel tank stay changed to ISO system on four frame numbers (214-22210-20, 214-22241-00, 214-22242-00, 214-21268-00). During this period the fuel tank stay changed to ISO system on four frame numbers (214-22210-20, 214-22241-00, 214-22242-00, 214-21268-00). During this period the fuel tank stay changed to ISO system on four frame numbers (214-22210-20, 214-22241-00, 214-22242-00, 214-21268-00). During this period the fuel tank stay changed to ISO system on four frame numbers (214-22210-20, 214-22241-00, 214-22242-00, 214-21268-00).
 (02) Eng # (UNKN)-13000. Went to ISO standard (Eng # unknown). Changes in this frame are the 5mm threads on the fittings for the rectifier, ignition switch, brake light switch and ignition coil mounting. To replace a (00 or 01) frame with (02), in addition to above will require purchasing the associated ISO screws for the aforementioned components.
 (03) Eng #13001-present. Still ISO. Only change here is in gas tank mount. NOT interchangeable with (00-01-02) frames.

DT1A TO DT1B **(1968) (1969)** **MODEL CHANGES**

Note

THE FOLLOWING INFORMATION MUST BE USED AS A GUIDE ONLY TO INDICATE THE DIRECTION TAKEN BY VARIOUS MODIFICATIONS. IT IS INCLUDED ONLY AS AN AID TO SERVICING THE DT1 SERIES AND, SHOULD A QUESTION ARISE REGARDING A CERTAIN PART, THE MECHANIC SHOULD REFER TO AN UP-TO-DATE PARTS BOOK, SERVICE OR PARTS NEWS BULLETIN, OR THE MANUFACTURER.

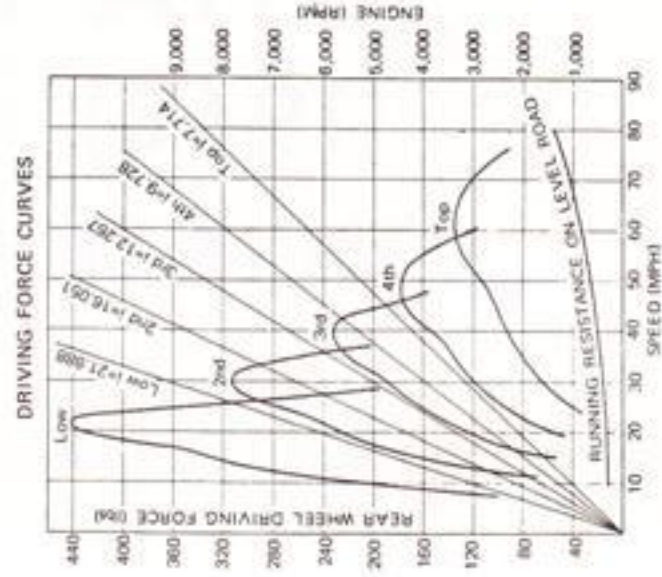
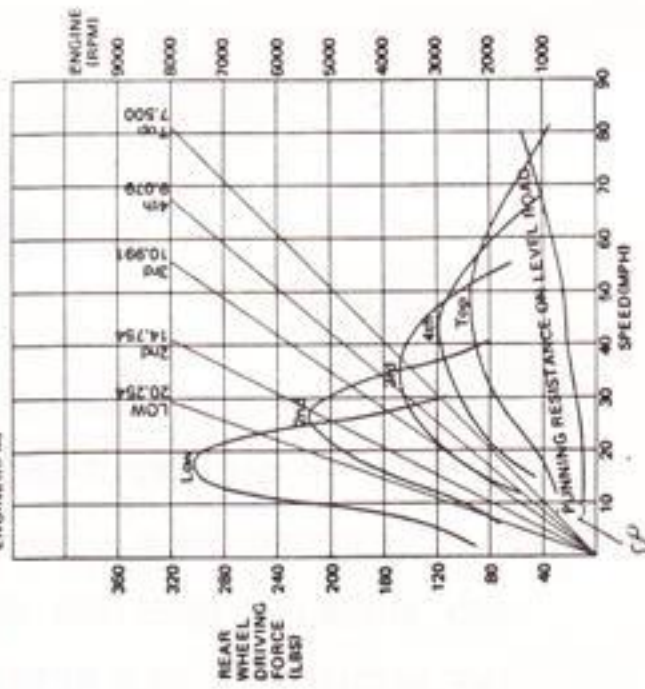
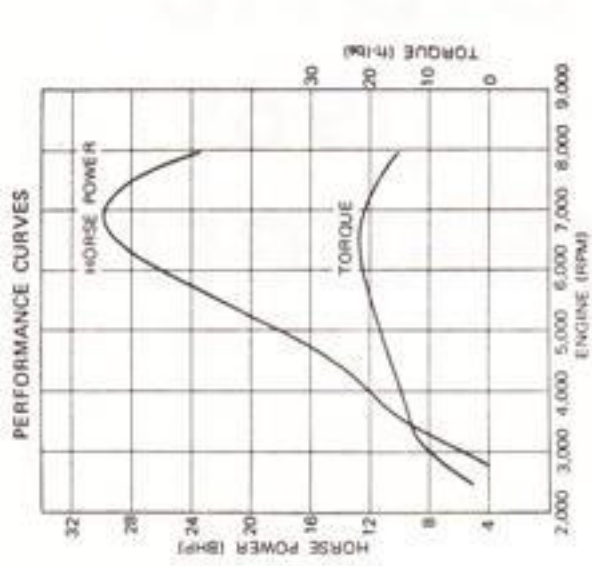
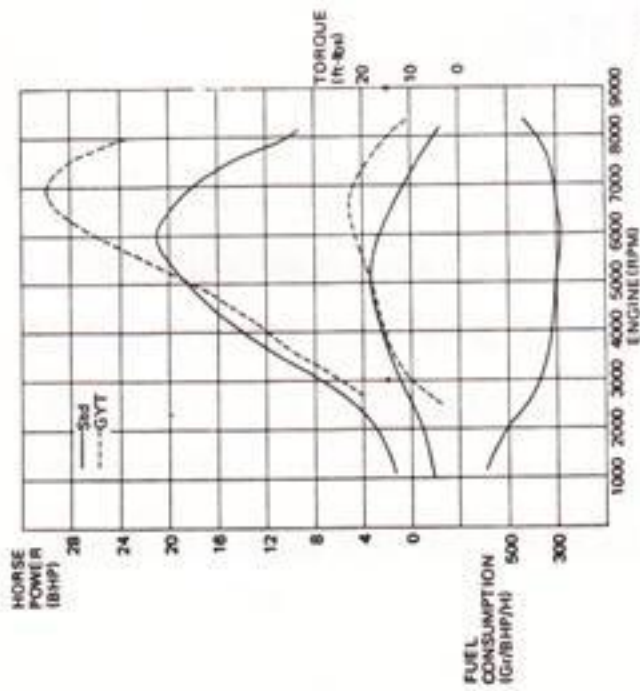
III. PERFORMANCE CURVES

Performance Curves

**DT1C
MX**

3. Performance Curves

**DT1E
MX**



DT1A TO "B" CHANGES

IV. DESCRIPTION

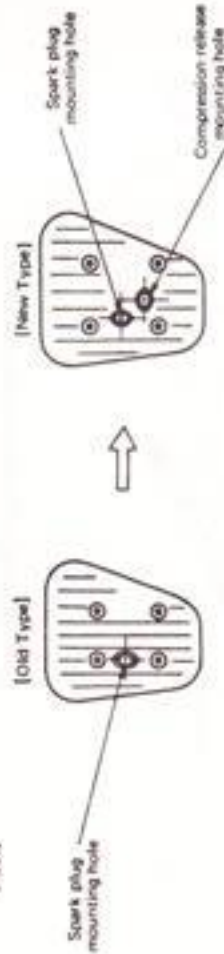
1. Engine

Description will be given as to the differences in the engines between the former and new models.

1) Cylinder Head

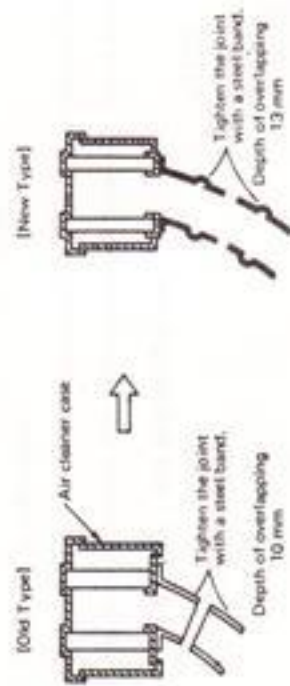
A hole is added for fitting a compression release or another spark plug. On marketed models, the hole is filled with a blind plug and gasket.

(The compression release used should be 19 mm reach in length. Do not use any other size.)

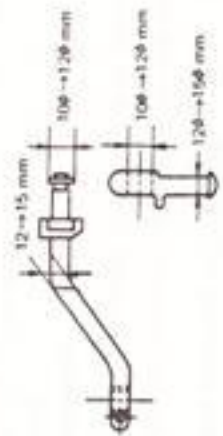


2) Air Cleaner

In order to improve both sealing and dust proofing effects, the element and joint rubber are made into one unit. The joint rubber is designed to be connected in a manner such that the raised portion of the upper joint rubber is fitted into the recessed portion of the lower joint.

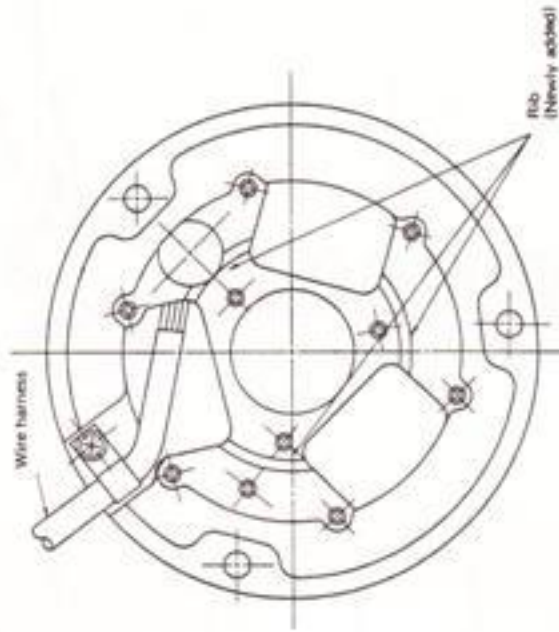


3) Kick Crank and Kick Lever

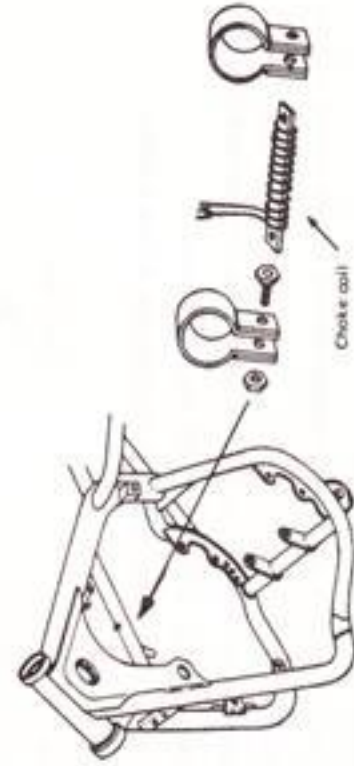


5) Flywheel Magneto Assembly

To prevent the oil seal from coming off the crankshaft, three ribs are provided for the flywheel magneto base.

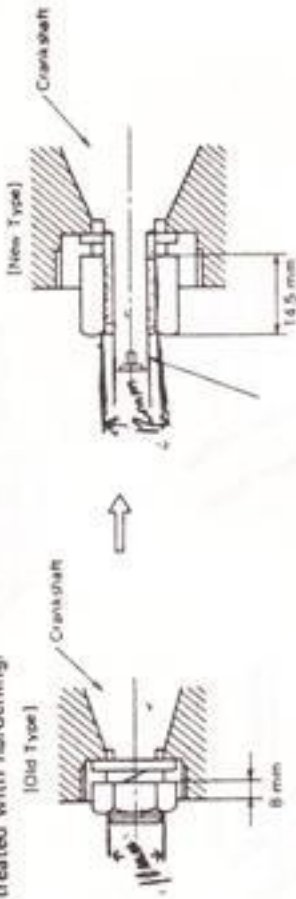


6) Choke Coil



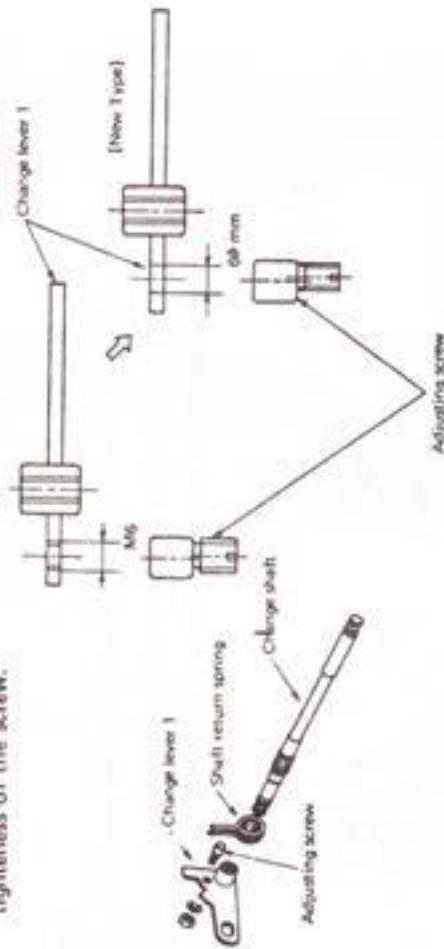
9) Flywheel Magneto Mounting on Crankshaft

To keep the flywheel magneto secured to the crankshaft, improvements have been introduced to these components, and at the same time, the threaded portion has been treated with hardening.



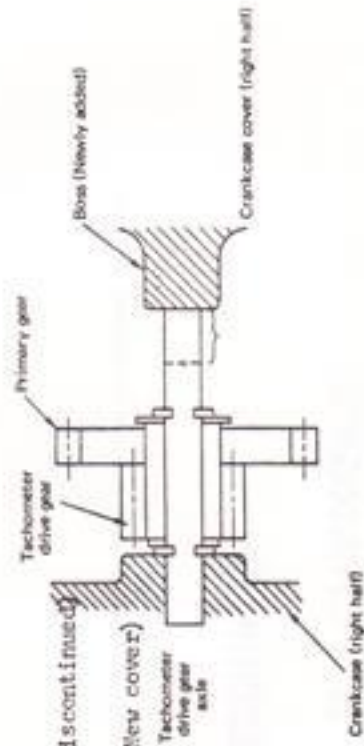
10) Change Lever 1 and Adjusting Screw

The adjusting screw hole tapped in the change lever 1 is no longer in use. No machined portions will be provided for both the 6 mm hole and the screw in order to increase tightness of the screw.



8) Tachometer Drive Gear Axle

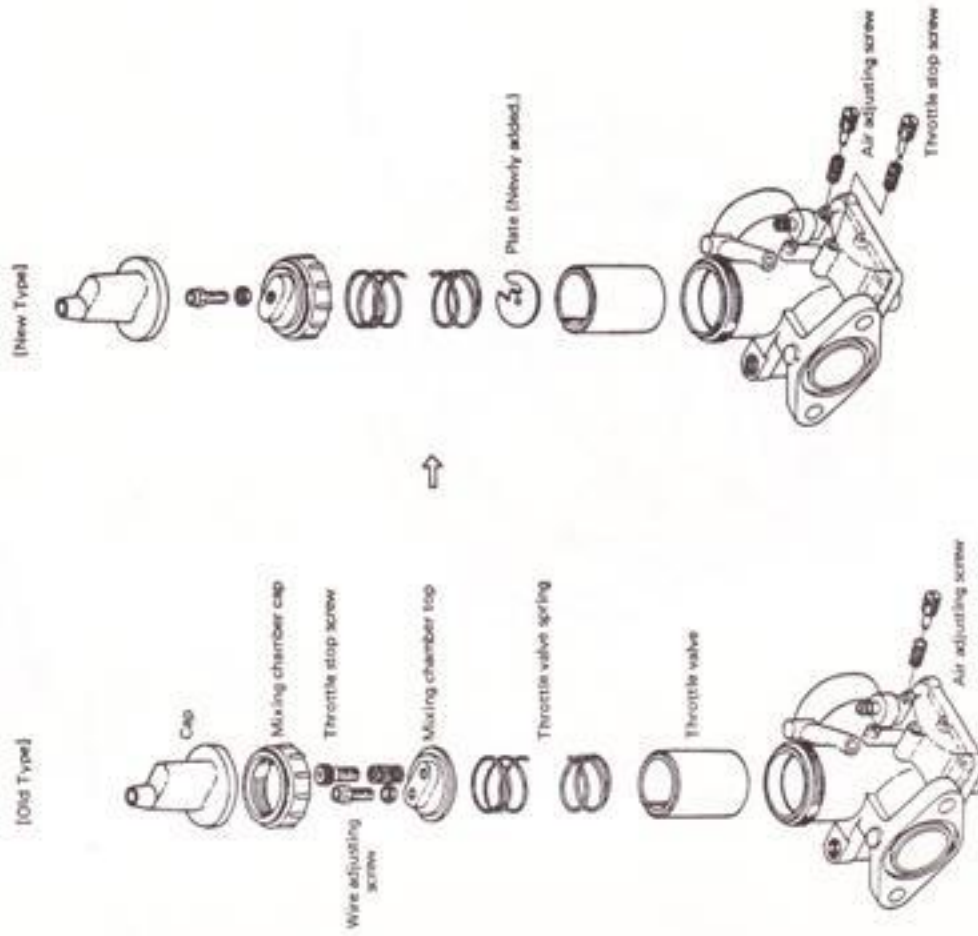
To prevent the tachometer drive gear axle from becoming loose, a boss is provided for the crank case cover (right half).



- DT1A (00) 49.6mm L.O.A. (Discontinued)
- DT1A (01) 68.6mm L.O.A.
- DT1B 63.0mm L.O.A. (New cover)

6) Carburetor

- 1 The idle speed adjustment screw (throttle stop screw) is installed in a horizontal position, instead of the vertical position.
- 2 Following the change in 1 above, both mixing chamber top and mixing chamber cap are made into one unit.
- 3 To prevent the mixing chamber cap from becoming loose, a rubber patch is bonded to the cap surface which is in contact with the throttle valve.
- 4 To tightly secure the throttle wire to the throttle valve, a plate is added.



DT1 SERIES

PERTINENT PARTS and SERVICE BULLETINS

Note

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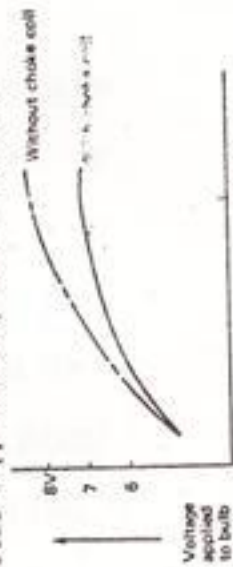
DATE: _____

The DT1B comes equipped with a lighting circuit choke coil designed to reduce voltage surge at high RPM. (See DT1B Supplementary Service Manual). This coil can be installed, if necessary, in the DT1A by following the steps below:

CHOCO COIL



1. Remove the gas tank and ignition switch.
2. Cut into the BLUE lighting circuit wire coming from the ignition switch. Install one male and one female connector on the bare wire ends. (Use solder. Do not merely crimp in place.)
3. Install the DT1B choke coil as shown. Re-install the ignition switch and hook up the connectors at points "1" and "2".
4. Re-install the gas tank and hook up the remaining wiring and fuel lines.
5. Check the operation of the choke coil as per the instructions in the DT1B Supplementary Service Manual.



DT1A and B Lighting Voltage Curve

DATE: _____

DT1A - Comments to Suppliers, Electrical Department

In order to use in the application of the DT1B lighting coil in the DT1A (See DT1B Supplementary Service Manual) the factory has designed a connector which will eliminate the necessity of cutting and splicing the BLUE primary lead.

INSTALLATION:

1. Remove the gas tank.
2. Install the DT1B choke coil as shown in Motorcycle Parts News Bulletin #246.
3. Hook the choke coil leads to the connectors on the sub-load.
4. Pull the plastic wiring loom connector apart at the ignition switch.
5. Hook the sub-load between the wiring loom male and female connectors.
6. Re-install the gas tank and fuel lines.
7. Check the operation of the choke coil as per the instructions in the DT1B Supplementary Service Manual.

ADDITIONAL INFORMATION:

Additional information can be obtained in Motorcycle Parts News Bulletin #246.

PARTS BOOK:

Please make the following additions to the Second Edition (Blue cover) DT1A Parts Book:

Page	Ref. No.	Part Number	Part Name	Price	Discount
68	26-33	650-214-283	Choke Coil, (complete)		
68	26-34	211-8193-09	Connector, sub-load		

PLEASE BRING YOUR PARTS BOOKS UP TO DATE

MOTORCYCLE SERVICE NEWS

YAMAHA INTERNATIONAL CORPORATION
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ENDUROS INTERCHANGE LIST FOR MODIFICATION AND PERSONALIZATION

The following list has been compiled as an aid to the progressive dealership that wishes to personalize and/or modify any of the Enduro line. The dealer must remember, however, that engine modifications, such as the installation of a GYT Kit head to a stock engine, will void the Warranty on a machine. Customers who desire any engine modifications including those in this list must be advised that the factory and dealer responsibility towards Warranty has been negated and, for all practical purposes, the customer is on his own.

The list below is intended to be used as a guide only and ordering should be done through the parts books for the models involved. This is due to the changing nature of parts and parts numbers.

PART DESCRIPTION	PART NUMBER	ADAPTS TO:			REMARKS
		AT1	CT1	DT1	
AT1 TOP END					
Cylinder Head	248-11111-00	X	X		Must be used as a set to convert the CT1 to 173cc.
Cylinder	248-11311-00				
Piston	248-11631-00				
Piston Rings	248-11601-00				
Piston Pin	137-11633-00				
Head Gasket	248-11181-00				
CT1 TOP END					
Cylinder Head	251-11311-00	X	X		Must be used as a set to convert the AT1 to 171cc.
Cylinder	251-11311-00				
Piston	251-11631-00				
Piston Rings	251-11601-00				
Piston Pin	251-11633-00				
Head Gasket	251-11181-00				
AT1M TOP END					
Cylinder Head	248-11111-70	X	X		Must be used as a set on the CT1. Can be used individually on the AT1.
Cylinder	248-11311-70				
Piston	248-11631-70				
Piston Ring	248-11611-70				
Piston Pin	248-11633-70				
AT1M EXPANSION CHAMBER	248-14610-70	X	X		Mikuni VM26SH (2mm larger than AT1 or CT1).
AT1M CARBURETOR	248-14101-70	X	X		
DT1 GYT CYLINDER HEAD	214-11111-70			X	Must be used as a set.
DT1 GYT CYLINDER	214-11311-70			X	
DT1 GYT PISTON	214-11631-70			X	
DT1 GYT PISTON RING	214-11611-70			X	
DT1 GYT EXPANSION CHAMBER	214-14610-70			X	
DT1 GYT CARBURETOR	214-14101-70			X	Mikuni VM26SH (an increase of 4mm over standard). Seals tach drive.
DT1 TACH DRIVE CAP	214-17819-00	X	X	X	
DT1 COMPRESSION RELEASE	650-214-002	X	X	X	

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ENDUROS INTERCHANGE LIST FOR MODIFICATION AND PERSONALIZATION--cont.

PART DESCRIPTION	PART NUMBER	ADAPTS TO:			REMARKS
		AT1	CT1	DT1	
DT1 DRIVE SPROCKETS					
	214-17461-30			X	13 teeth
	214-17461-40			X	14 teeth
	214-17461-50			X	15 teeth
	214-17461-60			X	16 teeth
DT1 REAR SPROCKETS					
	214-25440-10			X	40 teeth
	214-25442-10			X	42 teeth
	214-25444-10			X	44 teeth
	214-25446-10			X	46 teeth
	214-25448-10			X	48 teeth
	214-25450-10			X	50 teeth
AT1 DRIVE SPROCKETS					
	174-17461-30	X	X		13 teeth
	174-17461-40	X	X		14 teeth
	174-17461-50	X	X		15 teeth
	174-17461-60	X	X		16 teeth
AT1 REAR SPROCKETS					
	248-25443-10	X	X		43 teeth
	248-25445-10	X	X		45 teeth
	248-25447-10	X	X		47 teeth
DT1 FRONT FORK ASS'Y					
	214-23100-00	X	X	X	Upper/lower bearings identical.
DT1 21" FRONT RIM	94416-21038	X	X	X	To be used as a set with the appropriate spokes as listed below.
21" RIM BAND	94327-21024	X	X	X	
21" TUBE	94227-21031	X	X	X	
21" TIRE	94127-21071	X	X	X	
DT1 21" FRONT SPOKES	214-25104-10	X	X	X	
AT1 FRONT SPOKES	248-25104-10	X	X	X	
HIGH FRONT FENDER & BRACKET	650-980-002	X	X	X	Front fender only = 650-980-003
DT1B PASSENGER PEGS	120-27430-02	X	X	X	ISO
PASSENGER PEG NUTS	98803-12200	X	X	X	ISO

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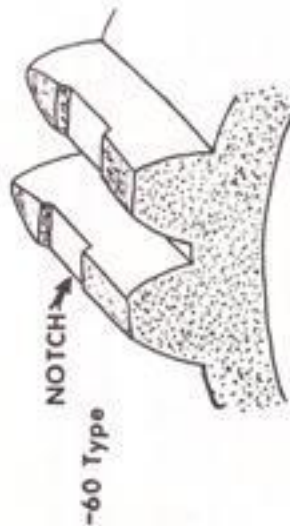
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ALL DT1/RT1 TRANSMISSION INTERCHANGE

The information listed in this bulletin concerns transmission gear interchangeability among all DT's and RT's. There are three basic transmission gear types in use among these models. The DT1-A and DT1-B employ large tooth, close ratio gears; the DT1-M and RT1-M, small tooth, close ratio gears; and DT1-S, DT1-C, and RT1, small tooth, wide ratio gears. Large and small tooth gears are not interchangeable, except as matching pairs.

Some small tooth gears used in the DT1-M and RT1-M close ratio gear box (low gear wheel and pinion, 2nd gear wheel and pinion, 3rd gear wheel, and 5th gear pinion) are identified by a cut mark on the gear tooth edge. These gears differ in number of teeth from the remaining DT1-S, DT1-C, and RT1 small tooth gears and are not interchangeable with them except as matching pairs.



GEAR	PART NUMBER	DESCRIPTION	CLOSE		RATIO		WIDE R.	
			DT1A-DT1B	DT1M-RT1M	DT1S-DT1C-RT1	Small Tooth	Small Tooth	Small Tooth
1	214-17211-	Gear, 1st wheel	00 (29t)	60 (34t)	10 (39t)	10 (34t)	10 (39t)	10 (34t)
	214-17411-	Axle, main	00 (13t)	60 (16t)	10 (15t)	10 (15t)	10 (15t)	10 (15t)
2	214-17221-	Gear, 2nd wheel	00 (26t)	60 (31t)	10 (34t)	10 (34t)	10 (34t)	10 (34t)
	214-17121-	Gear, 2nd pinion	00 (16t)	60 (20t)	10 (19t)	10 (19t)	10 (19t)	10 (19t)
3	214-17231-	Gear, 3rd wheel	01 (23t)	60 (29t)	10 (30t)	10 (30t)	10 (30t)	10 (30t)
	214-17131-	Gear, 3rd pinion	01 (19t)	10 (21t)	10 (21t)	10 (21t)	10 (21t)	10 (21t)
4	214-17241-	Gear, 4th wheel	00 (21t)	10 (26t)	10 (26t)	10 (26t)	10 (26t)	10 (26t)
	214-17141-	Gear, 4th pinion	00 (21t)	10 (26t)	10 (26t)	10 (26t)	10 (26t)	10 (26t)
5	214-17151-	Gear, 5th wheel	01 (19t)	10 (23t)	10 (23t)	10 (23t)	10 (23t)	10 (23t)
	214-17251-	Gear, 3rd wheel	01 (23t)	60 (29t)	10 (30t)	10 (30t)	10 (30t)	10 (30t)

* Tooth edges are notched. Not interchangeable with -10 type small tooth.

NOTE: For additional information see M/C PNB #260

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ALL DT1/RT1 TRANSMISSION INTERCHANGE--continued

MODEL	GEAR	WHEEL	PINION	RATIO	PRIMARY	SECONDARY	*SPEED IN GEAR
DT1A & B	1	29	13	2.231			30.1
	2	26	16	1.624			41.2
	3	23	19	1.211	65/21	44/15	55.3
	4	21	21	1.000	3.095	2.933	67.0
	5	19	23	0.826			81.2
DT1S & C	1	38	15	2.533			26.4
	2	34	19	1.789			37.4
	3	30	23	1.304	65/21	44/15	51.3
	4	26	26	1.000	3.095	2.933	67.0
	5	23	30	0.766			87.5
DT1M	1	36	16	2.250			27.7
	2	33	20	1.650			37.8
	3	29	23	1.261	65/21	44/14	49.4
	4	26	26	1.000	3.095	3.142	62.2
	5	23	29	0.793			79.0
RT1	1	38	15	2.533			26.1
	2	34	19	1.789			36.9
	3	30	23	1.304	65/21	39/15	50.7
	4	26	26	1.000	3.095	2.600	66.0
	5	23	30	0.766			86.2
RT1M	1	36	16	2.250			29.4
	2	33	20	1.650			40.0
	3	29	23	1.261	65/21	39/15	52.3
	4	26	26	1.000	3.095	2.600	66.0
	5	23	29	0.793			83.5

* Stock Rear Tire
7,000 RPM RT1 Models
8,000 RPM DT1 Models

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'70 & '71 MODELS _____ MECHANICAL DIFFERENCES _____

The information listed below compares the mechanical differences between the 1970 and the 1971 models. In this way, each mechanic will be made aware of variations in actual service procedures or possible parts interchangeability between '70 & '71 models. If there is no difference listed, then the part (and servicing procedures for that part) remain the same as the preceding year's model.

The following contains a general listing of original machine specifications for last year and this year. Previous SMB's should also be researched to locate any mid-year improvements not listed in this bulletin.

	DT1C	DT1E	Remarks
1. Muffler	214-14610-01-00 Bullet-shaped diffuser welded in silencer- (silencer/dif- fuser removable)	291-14610-10-00 (Same as RT1B) Bullet-shaped diffuser welded in muffler- silencer dimen- sions changed (diffuser non- removable). Also larger outlet pipe OD.	Individual old & new muffler components not interchangeable.
2. Frame	214-21110-03-33	275-21110-01-33	Same as RT1B. Only actual change is main switch location.
3. Rear swing arm	214-22110-02-33	275-22110-00-33	DT1E same as RT1B. Length from shock pivot to end of arm increased 1". Complete interchange- ability between years.
4. Rear wheel & hub	Standard DT1 parts.	Same as RT1 & RT1B parts.	Interchangeable as a set (including brake rod).
5. Brake rod	DT1 parts	Same as RT1 & RT1B parts.	Use with RT1(B) rear wheel & hub.
6. Rear cushion ass'y	214-22210-10-00	291-22210-70-00	New cushion same as on AT1C, CT1C, & RT1B (soft- er dampening).
7. Front brake shoe plate	214-25121-00-00	275-25121-00-00 Same as RT1B	Locating notch in plate (& fork leg guide bar) is wider and deeper for more strength.
8. Front fork ass'y	264-23100-60-52	291-23100-60-71 Same as RT1B	Interchangeable only as a set (extensive change in design & dimensions).
9. Steering under bracket	214-23340-00-33	275-23340-60-33 Same as RT1(B)	Two pinch bolts instead of one (as on DT1C).
10. Handle crown	214-23435-02-00	275-23435-01-00 Same as RT1B	Not interchangeable.

DT1A Change Lever and Adjusting Screw (Parts Book Fig. 7-8 & 9)

The adjusting screw diameter between the threads and the eccentric head has been enlarged for increased strength. The change lever hole has also been changed to accommodate the increased screw diameter.

New Part



Old Part

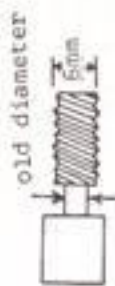


Fig. #	Part Name	Old Part No.	New Part No.	Price
7-8	Change Lever	214-18121-00	214-18121-01	Same
7-9	Adjusting Screw	136-18186-00	214-18186-00	Same

New parts will be fitted on production machines after engine number 11572.

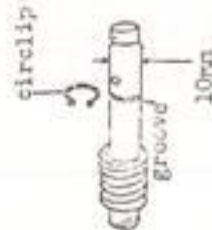
Interchangeability: Before engine number 11572, the parts must be replaced as a set.

DT-1A Gear, Pump Drive

OLD PART



NEW PART



Changes:

- The new part has a continuous 10mm shaft.
- The shim that used to hold the gear in place has been replaced by a circlip.
- Diameter of the gear center hole has been increased to 10mm.

Part Name	Old Part No.	New Part No.	Price	Disc.
Worm Shaft	214-13175-00	214-13175-01	No change	
Pump Drive Gear	214-13176-00	214-13176-01	No change	
Circlip	-----	91430-01336		
Shim	148-16331-00	-----		

Interchangeability: The new type parts (worm shaft and gear) must be replaced as a unit until after engine no. 7955.

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DT1/RT1 SERIES FRONT FORK COMPARISONS

Ever since the first DT1 was sold, Yamaha International engineers have been improving the front fork dampening characteristics. These improvements have required several design changes. To permit a better understanding of parts modifications, and to aid in parts identification, the history and dimensions of the main DT1 front fork parts are listed below. The RT1 series is also listed since DT1 & RT1 front forks each year are identical.

NOTE: Miscellaneous items, such as seals, washers, and clips are not included as these can be easily identified through the parts books.

	DT1-A (1968) DT1-R (1969)	RT1-S (1969)	DT1 E MX RT1 E MX (1970)	DT1 E MX RT1 E MX (1971)
Oil Capacity	7.1 oz.	7.1 oz.	7.1 oz.	5.9 oz.
Fork Spring	214-23141-00 438mm std. length	214-23141-00 438mm std. length	214-23141-00 438mm std. length	214-23141-00-00 438mm std. length
Inner Tube	214-23124-00 	264-23124-60 	275-23124-60 	291-23124-60-00
Slide metal	168-23125-01 	168-23125-01 	275-23125-60 	None-Inside diameter of outer fork leg acts as bushing.
Spacer, lower	NONE	264-23166-60 	NONE	NONE

DT1/RT1 SERIES FRONT FORK COMPARISONS-continued

	DT1A (1968) DT1R (1969)	DT1S (1969)	RT1 E MX DT1C E MX (1970)	DT1 E MX RT1 E MX (1971)
Cylinder comp.	214-23170-00 	264-23170-60 (Discontinued) 	264-23170-6A Interchangeable with DT1S. 	291-23170-60-00
Spring (to prevent topping out). Fits over cylinder.	NONE	264-23152-60 	264-23152-60 	NONE
Piston	214-23171-00 	NONE	NONE	278-23171-50-00
Spacer, upper	214-23118-00 	264-23118-60 	264-23118-60 	291-23118-60-00
Outer tube	214-23125-00-35 	214-23126-00-35 	275-23126-60-35 	291-23126-60-00

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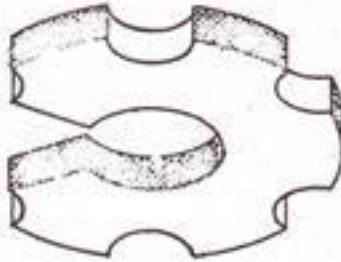
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DT1(A) OIL SEAL RETAINER (Ignition side) Part No. 214-15317-09

Occasional failures of the crankcase oil seal behind the magneto assembly on DT1A's has prompted the factory to design a seal retainer (see drawing below) for installation behind the magneto backing plate.

This retainer should be installed on any DT1A where the seal has failed. The retainer cannot be installed on the DT1B as this model has an improved magneto backing plate which incorporates its own seal retainer.



Add to DT1A Parts Book:

Ref. No.	Part Number	Description	Quantity	Price	Disc.
14-18	214-15317-09	Retainer, oil seal	1	.48	50%

(On page 33: sketch in the seal retainer behind the magneto backing plate, mark the sketch with the Ref. No. 14-18.)

Add to DT1A Service Manual:

Add Paragraph "E" (below) to IV-7 on page 31. Include the following text:

ASSEMBLY INSTRUCTIONS:

1. Remove magneto side cover.
2. Remove magneto rotor assembly.
3. Remove stator backing plate (3 screws).
4. Install oil seal retainer over crankshaft end, slot up, and butt snugly against crankcase surfaces.
5. Reinstall stator backing plate making sure seal retainer is centered correctly.
6. Install magneto rotor assembly.
7. RESET IGNITION TIMING (3.2mm BDC stock; 2.3mm BDC GYT kit)

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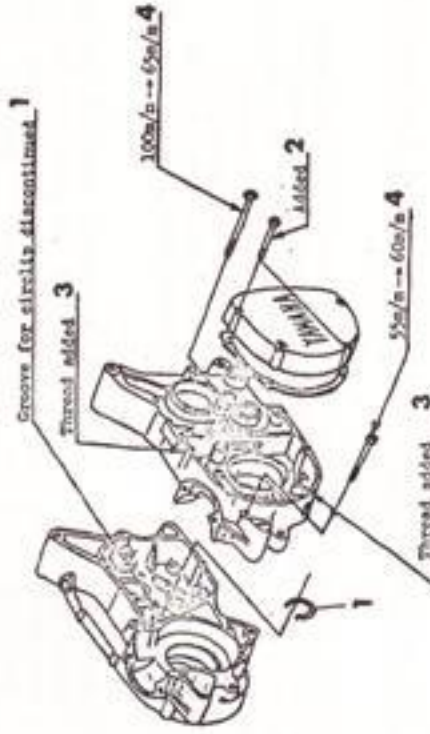
DATE Feb. 2, 1970

DT1-B CRANKCASE AND COVER MODIFICATIONS

In order to increase efficiency in the manufacture of DT1-C (and almost identical DT1) crankcases, the factory has designed a new casting mold for the above. Certain DT1-B's (after E/N 34176) and all DT1-C's utilize this newest improved crankcase. The changes consist of:

- (1.) The elimination of a circlip and its retaining groove in the right crankcase half.
- (2.) The magneto cover now has four instead of two retaining screws.
- (3.) Additional threaded holes added to the left crankcase half to allow for the additional magneto cover screws.
- (4.) The length of these two crankcase securing screws has been changed because their threaded anchor points in the R.H. case have been repositioned slightly.

The older, two screw magneto cover (No. 214-15411-00) is being discontinued. The new type (-01) will be automatically sent on all orders as soon as the -00 type is out of stock. The new magneto cover can be used on early DT1-B cases. The new crankcases are not interchangeable with early (prior to E/N 34177) DT1-B cases.



Ref. No.	Old Parts No.	New Parts No.	Description	Qty
1-1	214-15411-01	214-15411-01	Case, Stator (L.H.)	1
1-2-1	214-15411-01	214-15411-01	Case, Stator (R.H.)	1
1-3	214-15411-01	214-15411-01	Stator, Fan Head	1
1-4	214-15411-01	214-15411-01	Stator, Fan Head	1
1-5	214-15411-01	214-15411-01	Stator, Fan Head	1
1-6	214-15411-01	214-15411-01	Stator, Fan Head	1
1-7	214-15411-01	214-15411-01	Stator, Fan Head	1
1-8	214-15411-01	214-15411-01	Stator, Fan Head	1
1-9	214-15411-01	214-15411-01	Stator, Fan Head	1
1-10	214-15411-01	214-15411-01	Stator, Fan Head	1
1-11	214-15411-01	214-15411-01	Stator, Fan Head	1
1-12	214-15411-01	214-15411-01	Stator, Fan Head	1
1-13	214-15411-01	214-15411-01	Stator, Fan Head	1
1-14	214-15411-01	214-15411-01	Stator, Fan Head	1
1-15	214-15411-01	214-15411-01	Stator, Fan Head	1
1-16	214-15411-01	214-15411-01	Stator, Fan Head	1
1-17	214-15411-01	214-15411-01	Stator, Fan Head	1
1-18	214-15411-01	214-15411-01	Stator, Fan Head	1
1-19	214-15411-01	214-15411-01	Stator, Fan Head	1
1-20	214-15411-01	214-15411-01	Stator, Fan Head	1
1-21	214-15411-01	214-15411-01	Stator, Fan Head	1
1-22	214-15411-01	214-15411-01	Stator, Fan Head	1
1-23	214-15411-01	214-15411-01	Stator, Fan Head	1
1-24	214-15411-01	214-15411-01	Stator, Fan Head	1
1-25	214-15411-01	214-15411-01	Stator, Fan Head	1
1-26	214-15411-01	214-15411-01	Stator, Fan Head	1
1-27	214-15411-01	214-15411-01	Stator, Fan Head	1
1-28	214-15411-01	214-15411-01	Stator, Fan Head	1
1-29	214-15411-01	214-15411-01	Stator, Fan Head	1
1-30	214-15411-01	214-15411-01	Stator, Fan Head	1

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PLEASE BRING YOUR PARTS BOOKS UP TO DATE

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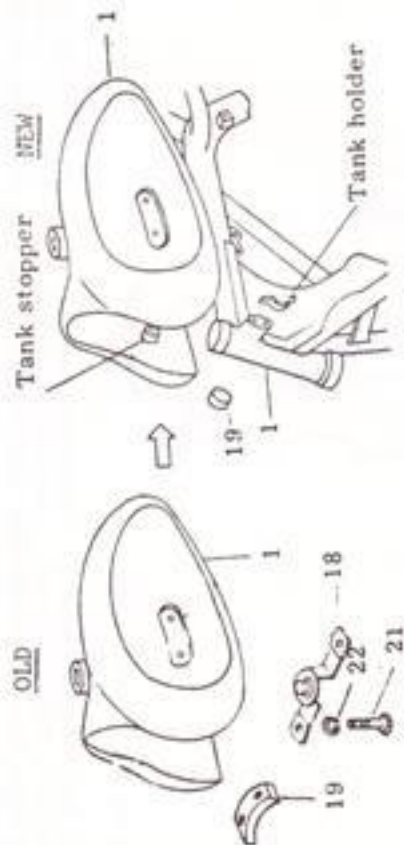
DATE 11/20/68

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Changed from Engine # 16798 ~

DT1(B) FUEL/FRAME MOUNTING (PARTS BOOK REF. NO. 20)

To provide a stronger method of securing the fuel tank to the frame, the factory has adopted the standard method used on all other Yamaha models. They have done away with the tank stay assembly that was previously used (No. 18 in the fig. below).



REF. NO.	PART NAME	OLD PART NO.	NEW PART NO.	QUANTITY	PRICE	DISC.
15-1	Frame	214-21110-00	-	1	-	-
20-1	Fuel Tank	214-24110-00	-	1	-	-
20-18	Stay, Fuel Tank	214-24115-00	-	1	-	-
20-19	Damper	214-24183-00	-	1	-	-
20-21	Bolt	91202-06015	-	2	-	-
20-22	Washer	92902-06200	-	2	-	-
15-1-1	Frame	-	214-21110-03	1	-	-
20-1-1	Fuel Tank (Pearl White)	-	214-24110-03-46	1	-	-
20-19-1	Damper	-	156-24181-00	2	-	-

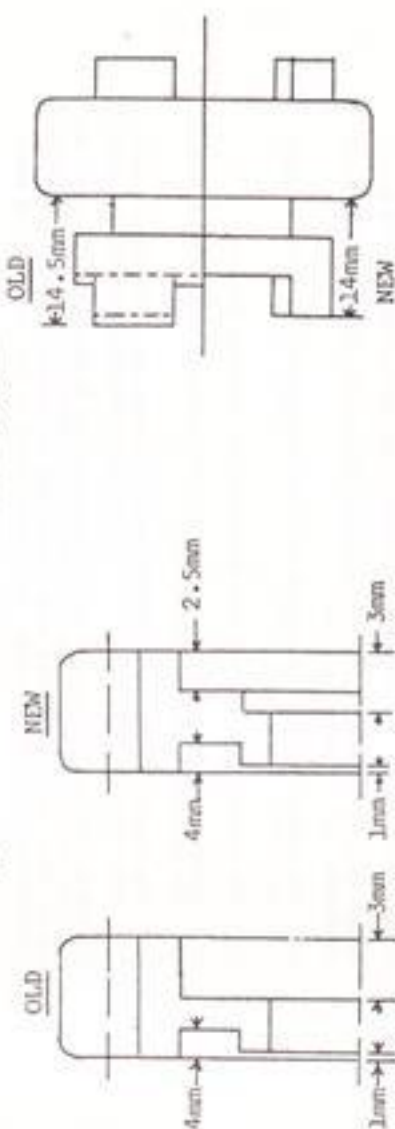
INTERCHANGEABILITY: Must be replaced as a set, including frame and fuel tank, up to and including engine Number 13000.

These parts are stock items on all DT1's after engine Number 13000. The motorcycles after engine Number 15000 are DT1B's, and the color of the tank is changed from Pearl White to Candy Gold.

DT1B 3rd GEAR WHEEL & 3rd GEAR PINION (PARTS BOOK REF. NO. 5)

Until now it had been possible to install the 3rd gear wheel (same as 5th gear pinion) backwards and remain undetected until the motorcycle was ridden. This happened because the pawls caught in the reversed gear wheel just enough to defy detection when the transmission was checked manually. Both the wheel and pinion have been modified to prevent any further possibility of this happening.

The height of the pawl has been shortened from 14.5mm to 14mm, measuring from the flat side of the gear to the end of the pawl. The 3rd gear wheel web that houses the end of the pawl slots has been increased by 2mm.



REF. NO.	PART NAME	OLD PART NO.	NEW PART NO.	PRICE	DISC.
5-5(21)	Gear, 3rd Pinion (5th Wheel)	214-17131-00	214-17131-01	-	-
5-7(22)	Gear, 3rd Wheel (5th Pinion)	214-17231-00	214-17231-01	-	-

INTERCHANGEABILITY: on all DT1B's, the parts are stock items and can be replaced individually. On all DT1's, the parts must be replaced as a set.

NOTE: the factory has stamped all the new type gears with the letter "N". When installing the gears, always make sure that either both gears have an "N", or neither one is marked. Also be sure that you have not put the gear in backwards to start with.

YAMAHA

MOTOCROSS

DTIB - DTIC

DTIS - DTIE

NOTE:

Yamaha Motocross models were released during the DTIC and DTIE model years. However, most parts are interchangeable with the earlier DTIA, DTIB and DTIS models. Most motocross parts differ in design from the DTIA G.Y.T. Kit parts.

Transmission Gear Assembly

4. Transmission Gear Assembly

The constant mesh, close ratio, 5-speed transmission makes it possible to fully utilize the steady performance of the engine throughout the entire speed range from low to high speed. The transmission gear reduction ratio between gears is closer than the DT1-E. For layout of the transmission and related parts, refer to Fig. 1 and 2.

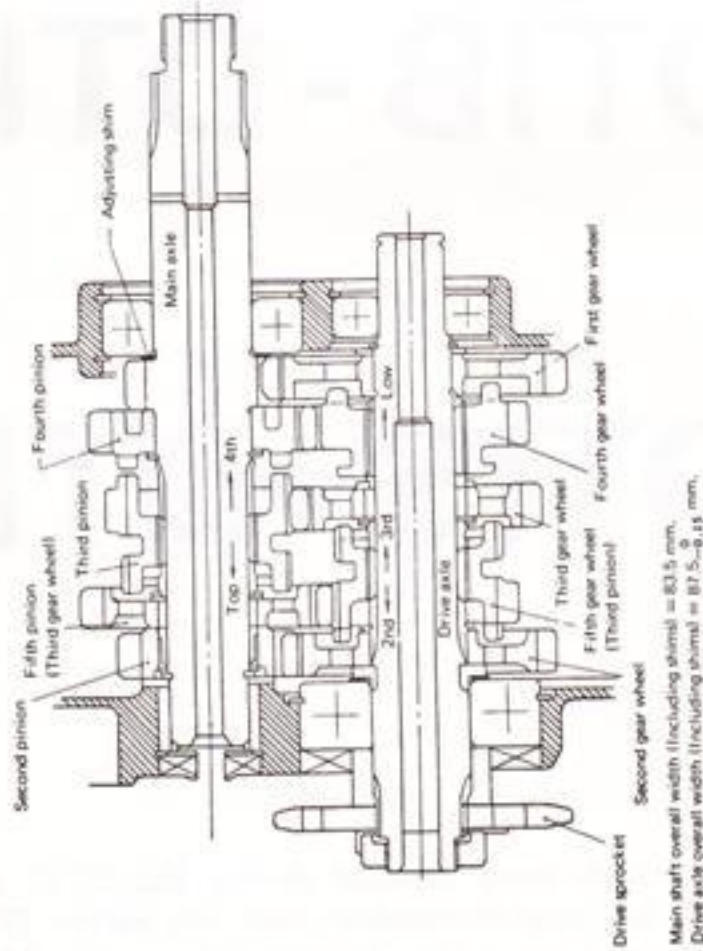


Fig. 1

NOTE:

THIS INFORMATION AND THAT ON THE FOLLOWING PAGES IS FROM THE DT1E-BOX SUPPLEMENTARY SERVICE MANUAL. IT IS PERTINENT TO THE DT1E-BOX ALSO.

Transmission Gear Assembly

The primary reduction ratio is $65/21 = 3.095$
The secondary reduction ratio is $44/14 = 3.142$

Therefore the total reduction ratios will be:

Primary reduction ratio x Transmission gear reduction ratio x Secondary reduction ratio = Total reduction ratio.

	Transmission Gear Reduction Ratio	Total Reduction Ratio
1st	$36/16 = 2.250$	21.887
2nd	$33/20 = 1.650$	16.051
3rd	$20/23 = 1.260$	12.265
4th	$26/26 = 1.000$	9.727
5th	$23/29 = 0.793$	7.715

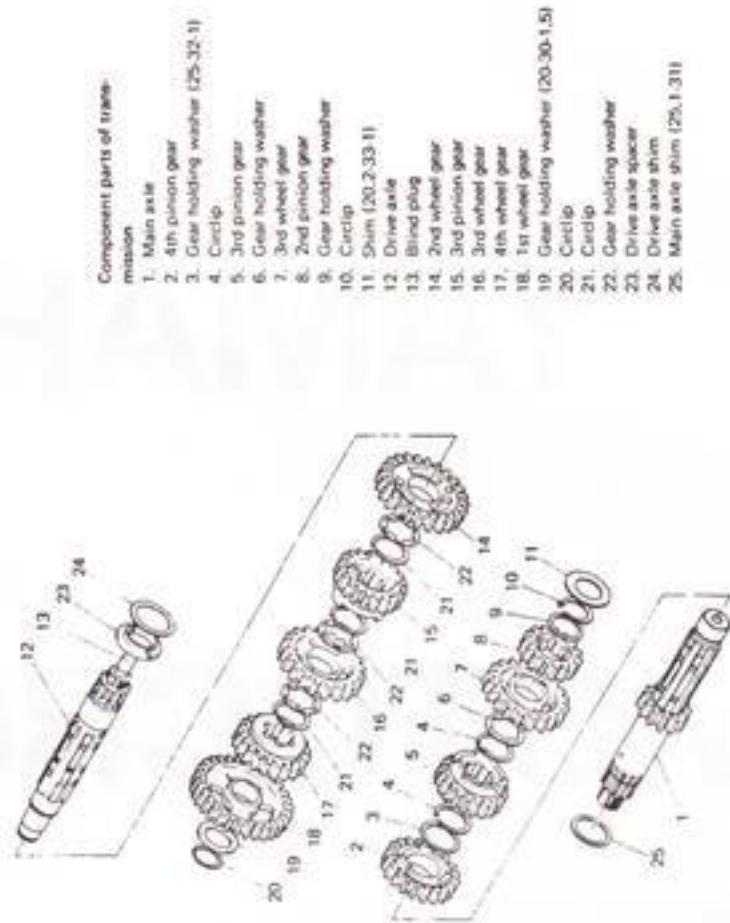


Fig. 2

Service Data

5. Service Data

- Piston clearance 0.0018 ~ 0.0020 in. (0.045 ~ 0.050 mm)
- Piston ring end gap 0.007 ~ 0.015 in. (0.2 ~ 0.4 mm)
(when ring is fitted in cylinder)
- Spark plug Standard = B-10EN
- Ignition timing 2.3 mm B.T.D.C.
- Oil pump

Minimum stroke : 0.20 ~ 0.25 mm (0.008 ~ 0.010 in.)
 Maximum stroke : 1.85 ~ 2.05 mm (0.077 ~ 0.081 in.)

- Fuel mixing ratio
 The DT1-MX, equipped with Yamaha Autolube system, uses mixed gasoline as fuel. The fuel mixing ratio is 30 : 1 for DT1-MX equipped with a Yamaha Autolube pump, and 15 : 1 when not using the Autolube pump.
- Gasoline and Oil
 Gasoline: Use high octane gasoline (more than 98 ~ 100 octane)
 Oil : Use Shell Super 2-stroke oil or oil of similar quality.
- Transmission oil
 Volume of oil : 1,000 cc. (11.0 U.S. qt) 10W/30
- Carburetor Setting Table

Name of Parts	Abbreviation	Specifications
Main Jet	M. J	#200-220
Air Jet	A. J	0.5
Jet Needle	J. N	505-4
Needle Jet	N. J	0.2 - 0.4
Throttle Valve Cutaway	C. A	#3.5
Bypass Port Diameter	B. P	1.4
Pilot Outlet Diameter	P. O	0.6
Pilot Jet	P. J	#80
Air Screw	A. S	turns out-one turn
Valve Seat Diameter	V. S	2.5
Starter Jet	G. S	#60

Service Data

- Float Level Adjustment
 The carburetor float level is checked by the Yamaha factory during assembly and testing. But rough riding, a worn needle valve, or bent float arm can cause the float level to fluctuate. If the float level rises, this will cause a rich fuel/air mixture that can cause poor performance and spark plug fouling. If the float level decreases, this can cause a lean fuel/air mixture that can result in engine damage. If the machine is subjected to continuous rough riding or many miles of travel, the float level should be checked and set regularly and in the following manner.

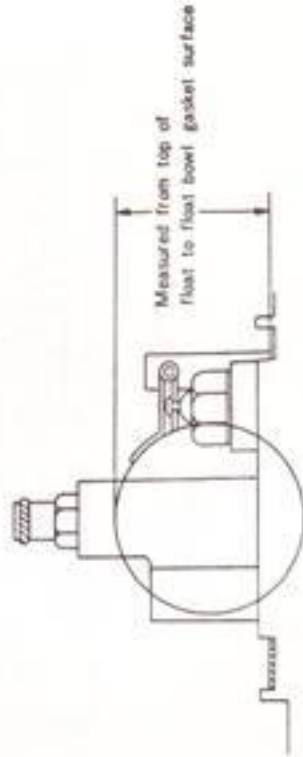


Fig. 3

- 1) Remove the float chamber body, and turn over the mixing body. Let the float arm rest on the needle valve with the spring fully expanded.
- 2) Then measure the distance from the float ϕ to the float chamber joint surface.
 Standard measurement : 24 mm. (0.945 in.)
- 3) When the distance measured is less than recommended bend the tang up. If it is greater, bend the tang down, (with carburetor body upside down.)

- Cleaning The Air Filter
 Wash the foam filter thoroughly in solvent until all dirt has been removed. Squeeze all solvent out. Pour oil onto the filter (any grade of 20 or 30 wt.), work it completely in, and then squeeze out the surplus oil. The filter should be impregnated with oil, but not "dripping" with it.

6. Change in Specifications

Participants in racing must change specifications of the machine depending on conditions of the racing course, road surface, soil, length of straightaways, angles of curves, number of curves, slopes, weather, temperature, and skill of the rider.

These factors and conditions must be determined by the rider himself after trial running over the whole race course.

Main Points to be Modified

- (1) **Carburetor Setting**
In addition to the specified Main Jet, the rider should carry with him spares whose size numbers are larger and smaller than specified by increments of 10 respectively.
- (2) **Secondary Reduction Ratio**
Consideration should be given to a combination of the drive sprocket and sprocket wheel so that gear shifting to 3rd and 4th is easy and will not cause an undue load on the engine (i.e. lugging).
- (3) **Spark Plug**
Change the plug by judging discoloration of the plug. Choose the most suitable one from B-9EN, B-10EN or B-11EN after setting carburetion.
- (4) **Tire Pressure**
Adjust the tire pressure according to road conditions and the rider's choice.
- (5) **Front Fork**
Adjust the front fork by adjusting the quantity or weight of oil. The oil amount is 5.85 fl. oz. (173 cc) weight is normally SEA #30.
- (6) **Rear Cushions**
Adjust the spring setting depending on the rider's choice.
- (7) **Handlebar**
Loosen the handle lever holders before racing. This will protect the rider's hands or fingers from getting injured in case of an accidental crash during the race.
(The lever can easily turn when the machine turns over.)

8. Checks and Service Prior to Racing

The following items should be checked and serviced before racing.

- (1) Check the cylinder, piston, and crankshaft assembly for any defects.
 - (2) Make sure that the carburetor is clean and correctly set.
 - (3) Check ignition timing, lead wire connection, and insulation.
 - (4) Retighten screws, bolts and nuts on all parts.
 - (5) Check the cables for wear and correct adjustment.
 - (6) Clean the gas tank and petcock.
 - (7) Adjust and oil the chain.
- Adjust the drive chain so that it has free play of approximately 1 in. (25 mm.) up and down at the center of the lower section with the rear wheel on the ground.
- The racer should devote the maximum possible time to inspection and service of the machine prior to racing. "Thorough inspection and service are the first step to victory."

7. Adjusting Ignition Timing

(1) Tools and instruments for adjusting

Dial gauge (accuracy - 1/100 mm)
Dial gauge stand 2
Continuity testing lamp, YAMAHA electro tester or YAMAHA point checker.
Thickness gauge
Slot head and Phillips-head screw driver

(2) Adjust ignition timing

- a) Set the point gap at 0.30 ~ 0.35 mm (0.012 ~ 0.014 in.). Inspect the breaker points for any pittings. Excessive pitting should be smoothed off with sandpaper (#400 ~ 600), and wiped off with hard, clean, white paper.
- b) Remove the spark plug and screw the dial gauge stand 2 into the plug hole. (On the DT1-MX head the spark plug hole is centered and parallel to the cylinder bore). Next, insert the dial indicator into the gauge stand 2. Bring the piston up to T.D.C. and set the zero on the dial face to line up exactly with the dial indicator needle.
Connect the positive (+) tester lead to the primary ignition terminal. Connect the negative (-) lead to the engine case (ground).
- c) Turn the crankshaft back well past 2.3 mm, to eliminate play in the gears, and then bring the piston up to exactly 2.3 mm B.T.D.C.
- d) Loosen the breaker plate holding screws and turn the breaker plate. When the points just start to open (the testing lamp lights up) tighten the holding screws. (Do not fully loosen the breaker plate holding screw as the breaker plate tends to shift its position).
Turning the breaker plate in the engine rotation direction causes ignition timing to retard, and turning it in the opposite direction advances ignition timing.
- e) After tightening the set screw, recheck timing.

9. WIRING DIAGRAM

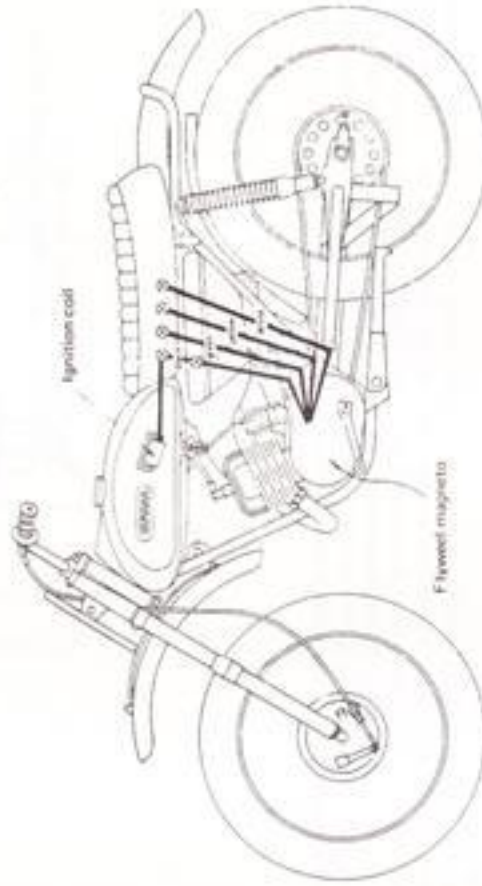
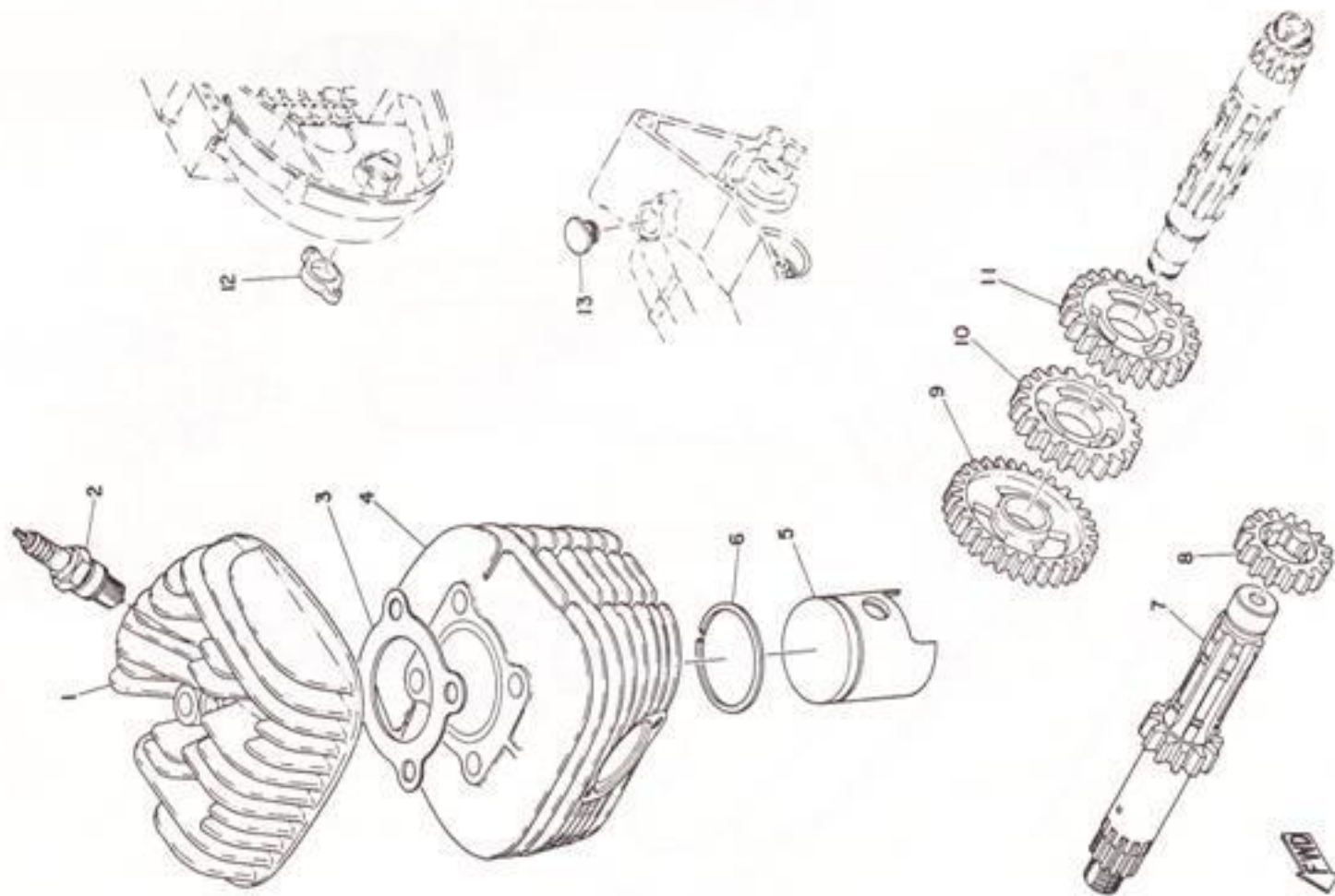


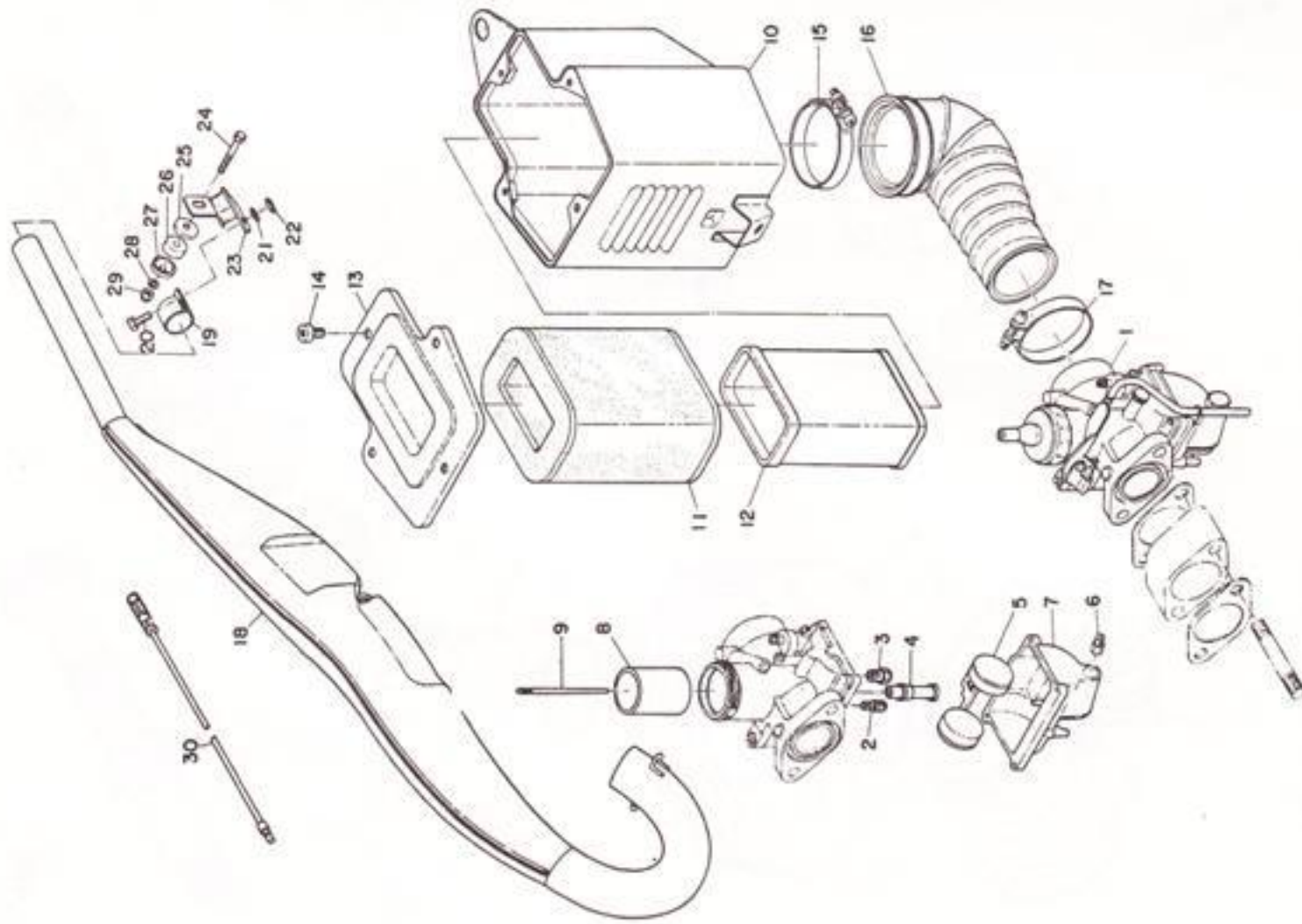
Fig. 32 ENGINE (CYLINDER & TRANSMISSION)



ENGINE (CYLINDER & TRANSMISSION)

Ref. No.	Part No.	Description	Qty	Applicable Machine No.	Remarks
32- 1	285-11111-00	HEAD, cylinder	1		
32- 2	94700-00017	PLUG, spark (B-10E)	1		
32- 3	285-11181-00	GASKET, cylinder head	1		
32- 4	285-11311-00	CYLINDER	1		
32- 5	285-11631-00-96	PISTON (S. T. D) 69.96 mm	1		
	285-11631-00-97	PISTON (S. T. D) 69.97 mm			U. R.
	285-11631-00-98	PISTON (S. T. D) 69.98 mm			1
	285-11635-00	PISTON (1st o. s) 70.25 mm	1		
	285-11636-00	PISTON (2nd o. s) 70.50 mm	1		
32- 6	285-11611-00	RING, piston (S. T. D.)	1		
	285-11611-10	RING, piston (1st o. s)	1		
	285-11611-20	RING, piston (2nd o. s)	1		
32- 7	214-17411-60	AXLE, main (16T)	1		
32- 8	214-17121-60	GEAR, 2nd pinion (20T)	1		
32- 9	214-17211-60	GEAR, 1st wheel (36T)	1		
32-10	214-17221-60	GEAR, 2nd wheel (33T)	1		
32-11	214-17231-60	GEAR, 3rd wheel (29T)	2		
32-12	241-17819-00	CAP, housing	1		
	ALTERNATE PART (for without oil pump)				
32-13	161-15426-00	COVER, oil pump	1		

Fig. 33 ENGINE (AIR CLEANER & EXHAUST)

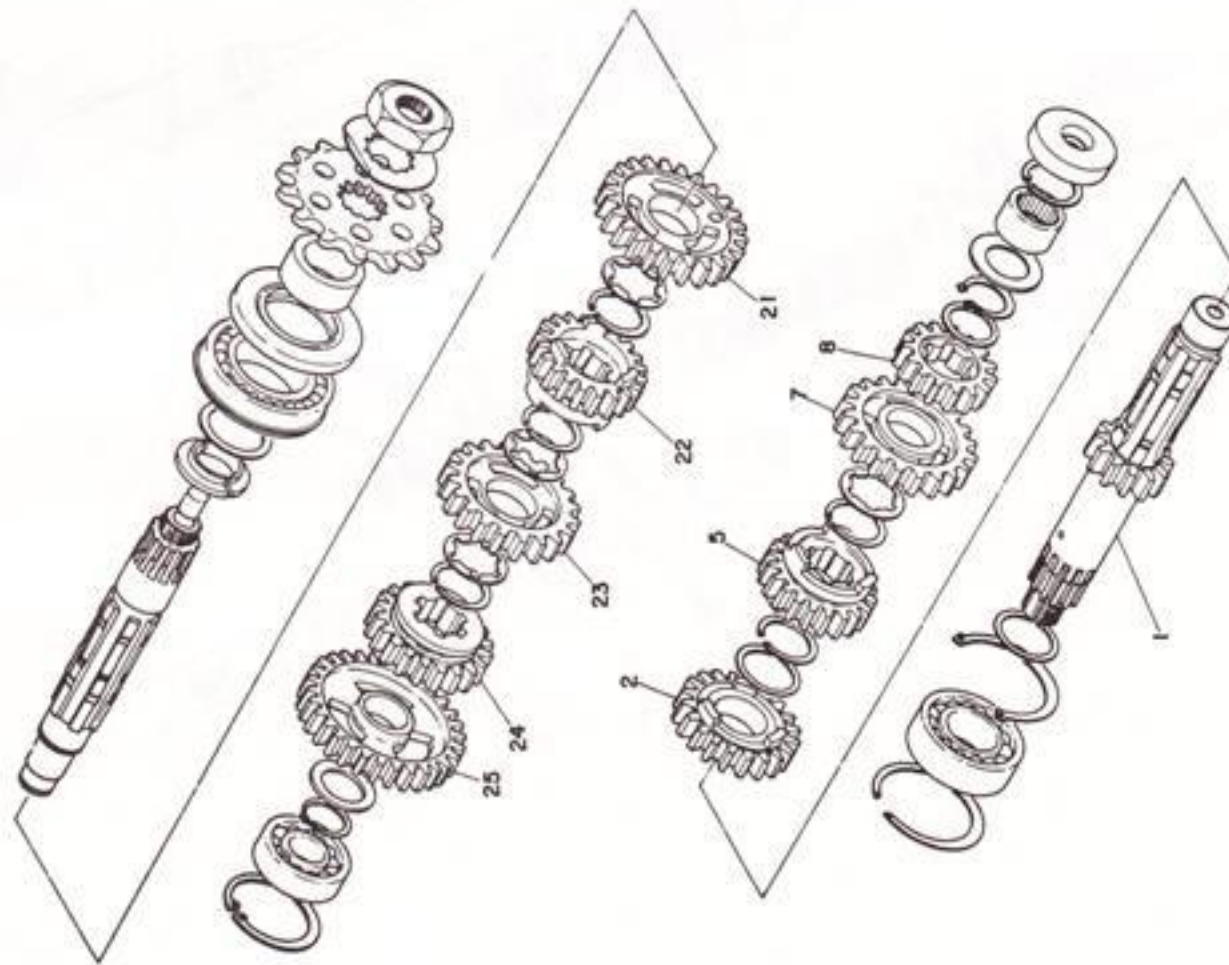


ENGINE (AIR CLEANER & EXHAUST)

Ref. No	Part No.	Description	Qty	Appl. Mach.
33- 1	285-14101-60	CARBURETOR ASS'Y	1	
33- 2	193-14142-80	. JET, pilot (#80)	1	
33- 3	285-14190-25	. VALVE SEAT ASS'Y (#2.5)	1	
33- 4	145-14141-32	. NOZZLE, main (0-2)	1	
33- 5	285-14185-00	. FLOAT	1	
33- 6	137-14143-38	. JET, main (#190)	1	
33- 7	137-14143-40	. JET, main (#200)	1	U.R.
33- 8	137-14143-42	. JET, main (#210)	1	
33- 9	285-14181-00	. BODY, float chamber	1	
33-10	211-14112-35	. VALVE, throttle (C.A. 3, 5)	1	
33-11	168-14116-07	. NEEDLE (5DP7-3)	1	
33-12	285-14411-00	CASE, air cleaner	1	
33-13	285-14451-00	ELEMENT	1	
33-14	285-14458-00	GUIDE, element	1	
33-15	285-14412-00	CAP, case	1	
33-16	92501-06010	SCREW, pan head	1	
33-17	285-14455-00	BAND	1	
33-18	285-14453-00	JOINT	1	
33-19	170-14455-00	BAND	1	
33-20	285-14610-10	EXHAUST PIPE ASS'Y	1	
33-21	285-14791-10	STAY, muffler 3	1	
33-22	91201-06020	BOLT	1	
33-23	92901-06100	WASHER, spring	1	
33-24	92801-06100	NUT	1	
33-25	214-14794-00	PLATE, muffler 2	1	
33-26	214-14781-11	STAY, muffler 2	1	
33-27	91201-06045	BOLT	1	
33-28	214-14793-01	PLATE, muffler 1	1	
33-29	92901-06100	WASHER, spring	1	
33-30	214-21635-00	NUT, crown	1	
33-31	284-82319-00	WIRE, sub lead	1	
33-32	214-14763-02	SPACER	1	

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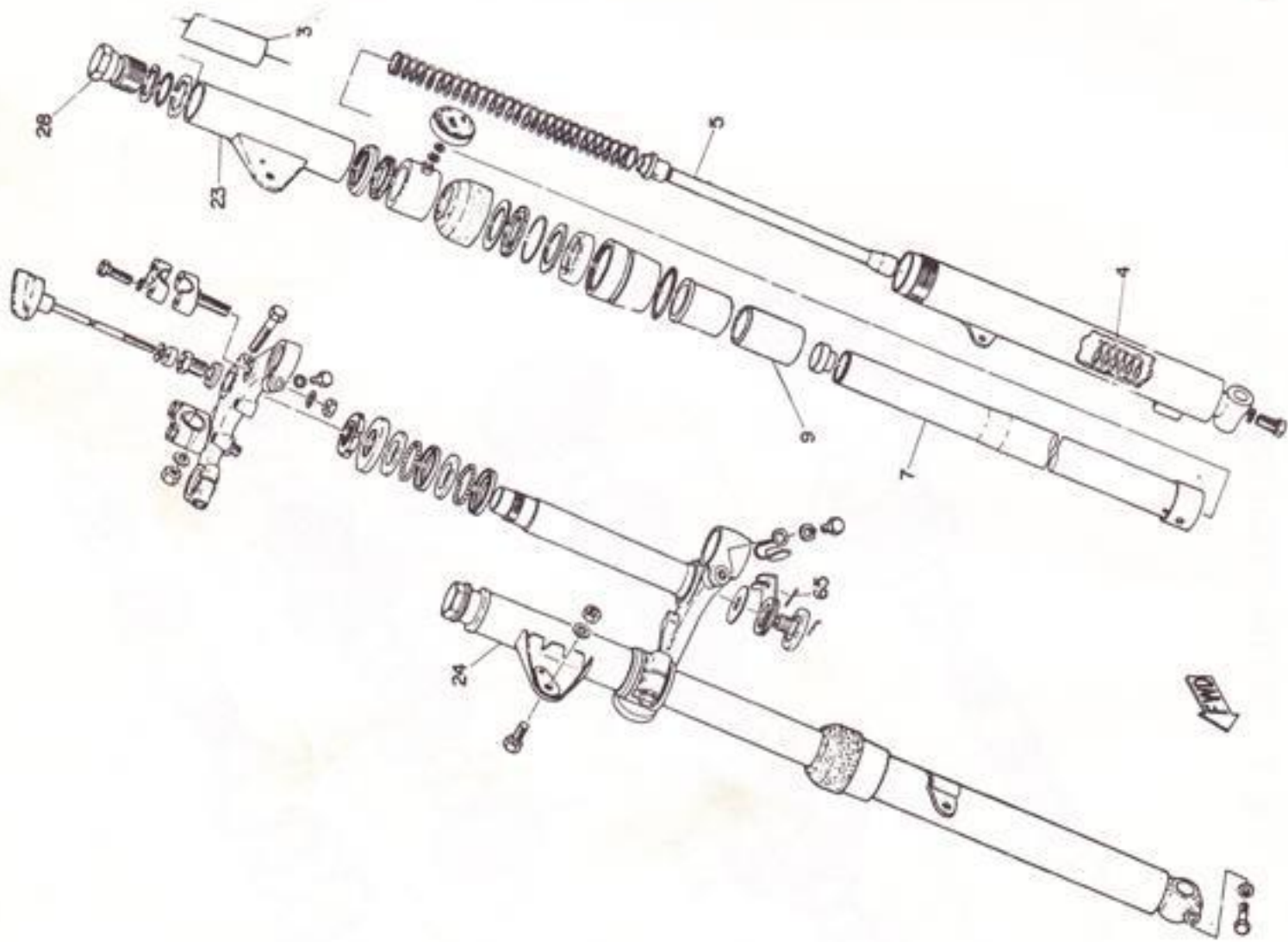
Fig. 1 TRANSMISSION GEAR



TRANSMISSION GEAR

Ref No.	Parts No.	Parts Name	Description Q'ty	S-R	Remarks
1- 0-1	214-17401-10-00	MAIN AXLE ASS'Y	1		
1- 1	214-17411-10-00	. AXLE, main	1		Std 13
1- 2	214-17441-10-00	. GEAR, 4th pinion	1		Std 21
1- 3	152-17226-00-00	. WASHER, gear hold	1		
1- 4	93440-25008-00	. CIRCLIP	2		
1- 5	214-17131-10-00	. GEAR, 3rd pinion	1		Std 19
1- 6	214-17216-00-00	. WASHER, gear hold	1		
1- 7	214-17231-10-00	. GEAR, 5th pinion	1		
1- 8	214-17121-10-00	. GEAR, 2nd pinion	1		
1- 9	132-17216-00-00	. WASHER, gear hold	1		
1-10	93410-19015-00	. CIRCLIP	1		
1-11	137-17427-00-00	SHIM	1		
1-12	93315-22004-00	BEARING	1		
1-13	93420-26024-00	CIRCLIP	1		
1-14	93104-07027-00	OIL SEAL	1		
1-15	156-17417-00-00	SHIM, main axle	1		
1-16	214-17474-00-00	CIRCLIP	1		
1-17	93306-20508-00	BEARING	1		
1-18	93450-52005-00	CIRCLIP	1		
1- 0-2	214-17402-10-00	DRIVE AXLE ASS'Y	1		
1-19	214-17421-00-00	. AXLE, drive	1		
1-20	214-17481-00-00	. PLUG, blind	1		
1-21	214-17221-10-00	. GEAR, 2nd wheel	1		
1-22	214-17131-10-00	. GEAR, 5th wheel	1		
1-23	214-17231-10-00	. GEAR, 3rd wheel	1		
1-24	214-17241-10-00	. GEAR, 4th wheel	1		
1-25	214-17211-10-00	. GEAR, 1st wheel	1		
1-26	168-17116-00-00	. WASHER, gear hold	1		
1-27	93410-19015-00	. CIRCLIP	1		
1-28	93440-25008-00	. CIRCLIP	3		
1-29	214-17216-00-00	. WASHER, gear hold	3		
1-30	156-17429-00-00	SPACER, drive axle	2		
1-31	168-17428-01-00	SHIM, drive axle	0.3		
1-32	93306-30506-00	BEARING	0.5		
1-33	93102-35054-00	OIL SEAL	1		
1-34	214-17462-00-00	COLLAR, distance	1		
1-35	214-17461-30-00	SPROCKET, drive	1		

Fig. 2 FRONT FORK

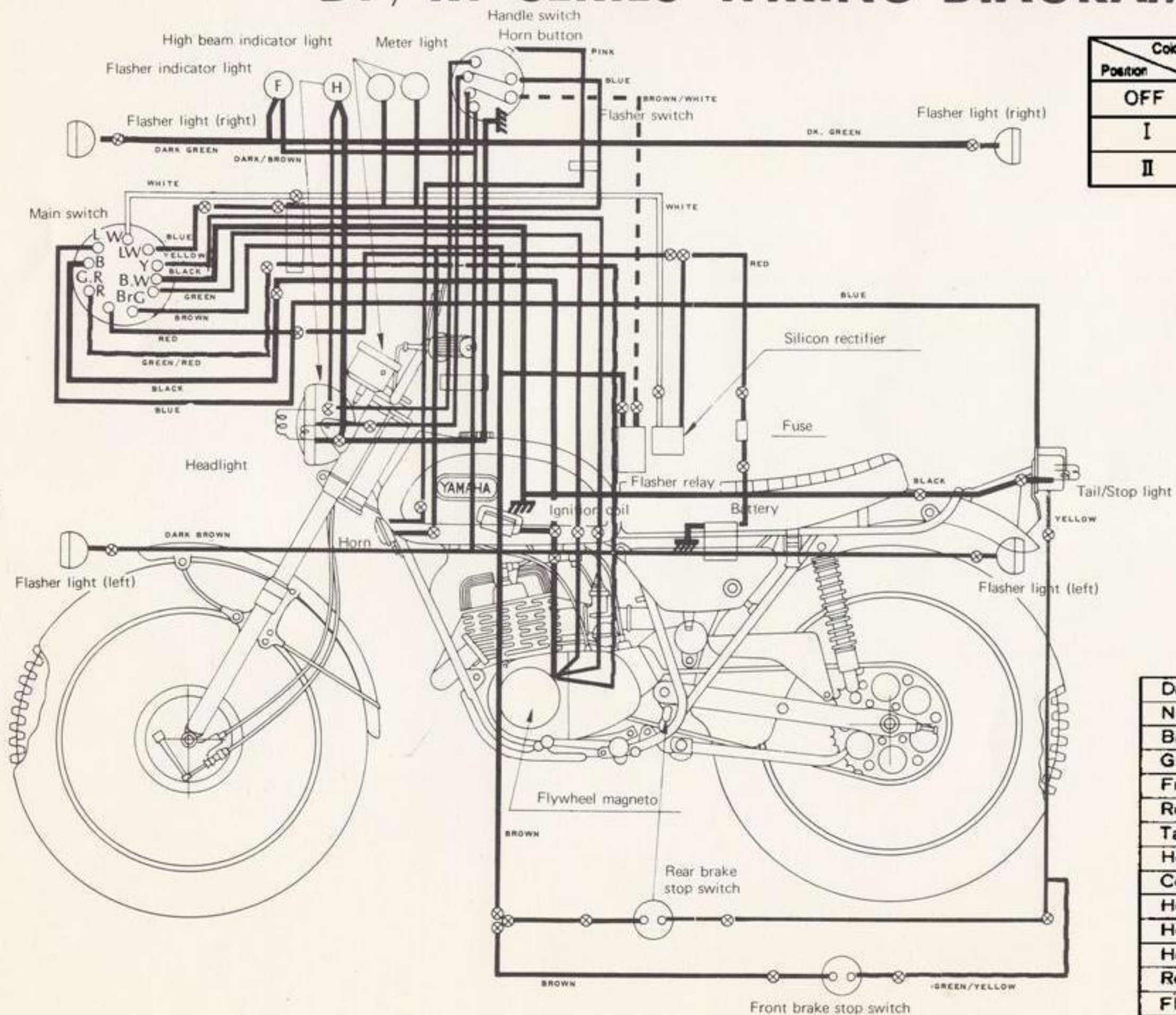


FRONT FORK

Ref No.	Parts No.	Parts Name	Description Q ty	S · R	Remarks
2-0-1	264-23100-60-52	FRONT FORK ASSY	1		CANDY ORANGE
2-1	214-23126-00-35	TUBE, outer (L.H)	1		
2-2	214-23136-00-35	TUBE, outer (R.H)	1		
2-3	264-23118-60-00	SPACER	2		
2-4	264-23152-60-00	SPRING	2		
2-5	264-23170-60-00	CYLINDER COMP.	2		
2-6	214-23141-00-00	SPRING, fork	2		
2-7	264-23124-60-00	TUBE, inner	2		
2-8	214-23142-00-00	SEAT, spring upper	2		
2-9	264-23166-60-00	SPACER	2		
2-10	168-23125-01-00	METAL, slide	2		
2-11	168-23147-00-00	O-RING	2		
2-12	214-23127-00-00	NUT, outer	2		
2-13	168-23145-00-00	OIL SEAL	2		
2-14	214-23146-00-00	WASHER, oil seal	2		
2-15	214-23156-00-00	CLIP, oil seal	2		
2-16	214-23155-00-00	RING, felt	2		
2-17	214-23165-00-00	WASHER, felt ring	2		
2-18	214-23144-01-00	SEAL, dust	2		
2-19	233-23122-00-00	COVER, outer (L.H)	1		
2-20	233-23122-00-00	COVER, outer (R.H)	1		
2-21	214-23163-00-00	PACKING (lamp stay)	2		
2-22	214-23116-00-00	GUIDE, cover under	2		
2-23	214-23121-01-52	COVER, upper (L.H)	1		CANDY ORANGE
2-24	214-23131-01-52	COVER, upper (R.H)	1		CANDY ORANGE
2-25	214-23115-00-00	GUIDE, cover upper	2		
2-26	214-23114-00-00	PACKING, (O-RING)	2		
2-27	214-23112-00-00	WASHER, cap	2		
2-28	264-23111-60-00	BOLT, cap	2		
2-29	214-23340-00-33	UNDER BRACKET COMP.	1		
2-30	122-23346-00-00	BOLT, under bracket	2		
2-31	92901-10100-00	WASHER, spring	2		
2-32	214-23318-00-00	HOLDER, wire	1		
2-33	91311-08020-00	BOLT	2		
2-34	214-23158-00-00	PACKING	2		
2-35	97201-08030-00	BOLT	1		
2-36	92901-08100-00	WASHER, spring	1		
2-37	164-23462-00-00	SEAL, dust	1		

YAMAHA MOTOR CO., LTD.

DT / RT SERIES WIRING DIAGRAM



Color Position	E	B	R	Br	L	G	W	GR	LW	Y
OFF	○	○								
I			○	○		○	○			
II			○	○	○		○	○	○	○

Chart of wire colors

Daytime charging circuit	Green
Night time charging circuit	Green/Red
Battery(+) circuit	Red
Ground circuit	Black
Front brake stop light circuit	Green/Yellow
Rear brake stop light circuit	Yellow
Tail light circuit	Blue
Head/Meter light circuit	Blue(L.W)
Common circuit	Brown
Head light main circuit	Yellow
Head light sub circuit	Green
Horn circuit	Pink
Rectifier circuit	White
Flasher light(Right)circuit	Dark green
Flasher light(Left)circuit	Dark Brown
Flasher relay circuit	Brown/White

