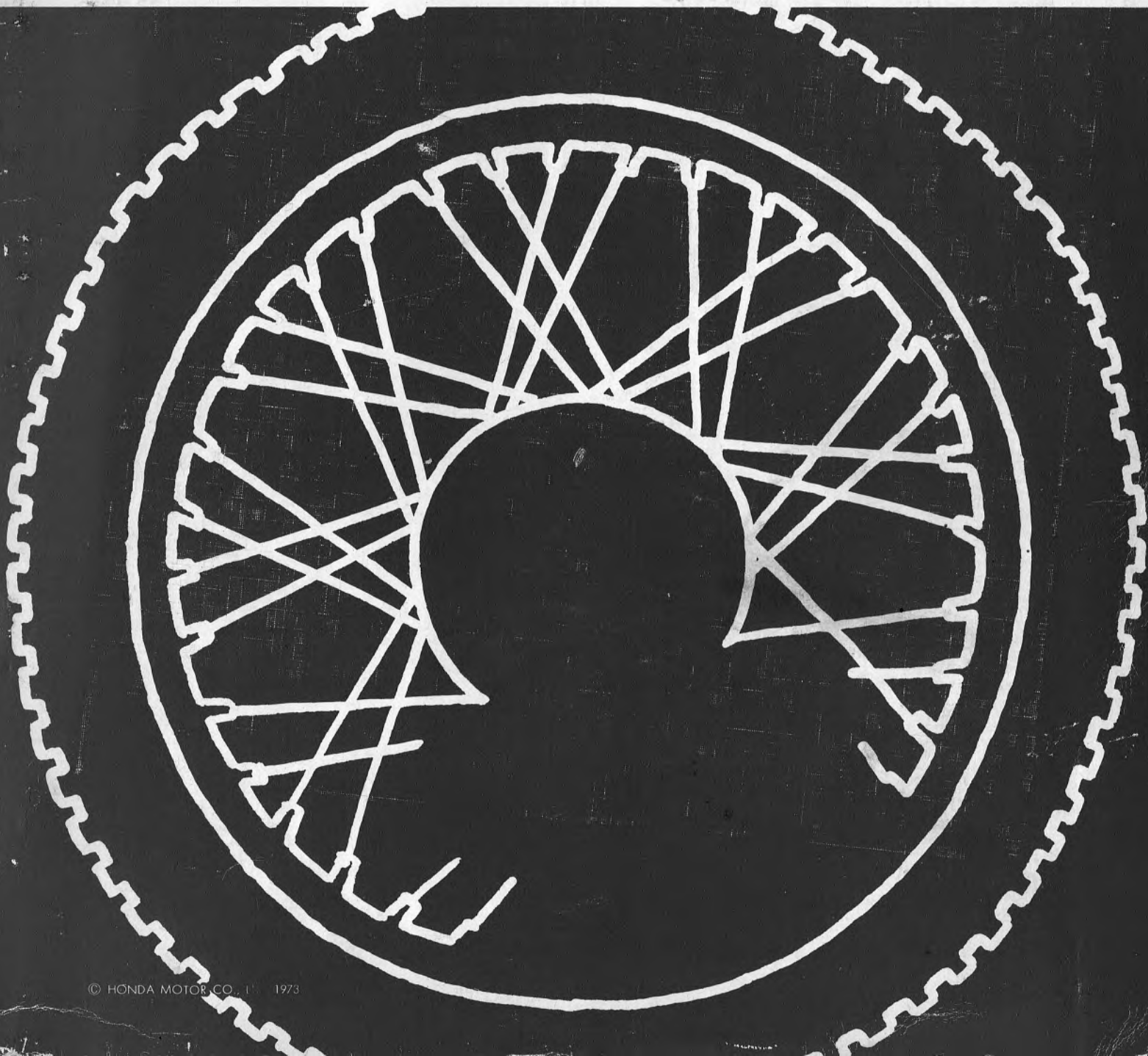
SHOP MANUAL

HONDA

125 • 175

CD 125 • 175
CD 125A • 175A
SS 125A • CL 125A



© HONDA MOTOR CO., LTD. 1973

FOREWORD

This Shop Manual is applicable to the following Models of HONDA 125 cc and 175 cc series :

Models CD125, CD125A, SS125A and CL125A

Models CD175 and CD175A

In the publication of this Manual, Models CD125A and CD175 have been used as the basic models, and though the information is applicable to the other models, some of the photographs and diagrams may vary to some degree on the different models.

Many photographs and illustrations were used to provide the serviceman with clear and easy understanding.

This Shop Manual is applicable to all model serial numbers shown below.

CD125 : Engine No. CD125E–1012758, Frame No. CD125–1012628.

CD125A : Engine No. CD125E–1063468, Frame No. CD125–1063196.

SS125A : Engine No. SS125AE–100001, Frame No. SS125A–100001.

CL125A : Engine No. CL125AE–300001, Frame No. CL125A–300001.

CD175 : Engine No. CD175E–1000001, Frame No. CD175–1000001.

To ensure proper servicing, the special tools must be used and all repairs made to the specified tolerances.

September, 20 1967

Service Division

HONDA MOTOR CO., LTD.

FEATURES

ENGINE

1. **Chain driven overhead camshaft**
   Assures quieter operation, due to the silent chain drive, and a more efficient higher speed engine resulting from the elimination of power loss.

2. **Dual oil filtering system**
   Provides only highly cleaned oil to lubricate the moving parts of the engine to greatly extend the trouble free engine life.

3. **Constant-meshed transmission gears**
   Make possible smooth and effortless gear change.

4. **Variable venturi carburetor**
   Provides economical operation and greater power output at all speeds.

FRAME

1. **Lightweight, highly stressed, pressed sheet steel "T"-bone frame**
   is an exclusive Honda designed.

2. **Dual telescoping front fork with swing arm rear suspension**
   Employing spring shocks and hydraulic damper for superb riding comfort in addition to excellent stability.

3. **Semi-raised handle bar**
   Permits a natural poise for an unfatiguing ride. Also, for easy application and safety, a ball end control levers are fitted with rubber tips.

4. **Bright head light and large tail and turn signal lamp**
   For greater safety at night riding.

CONTENTS

1. **SPECIFICATIONS** 1
2. **SPECIAL TOOLS** 17
   - CD175, CD175A 17
   - CD125/CD125A/SS125A/CL125A 19
3. **ENGINE (CD175, CD175A)** 21
   - 3.1 **Engine Removal and Installation** 22
     - A. Engine construction 22
     - B. Removal 22
     - C. Installation 23
   - 3.2 **Cylinder Head and Cylinder** 24
     - 1. Cylinder head 24
       - A. Construction 24
       - B. Disassembly 24
       - C. Inspection 25
       - D. Reassembly 26
     - 2. Cylinder head cover and breather 27
       - A. Description 27
       - B. Disassembly 27
     - 3. Camshaft 28
       - A. Construction 28
       - B. Disassembly 29
       - C. Inspection 29
       - D. Reassembly 29
     - 4. Rocker arm 30
       - A. Construction 30
       - B. Disassembly 30
       - C. Inspection 30
       - D. Reassembly 30
     - 5. Valve 31
       - A. Description 31
       - B. Disassembly 31
       - C. Inspection 31
       - D. Reassembly 32
     - 6. Valve seat 32
       - A. Description 32
       - B. Inspection 32
     - 7. Cylinder 33
       - A. Construction 33
       - B. Disassembly 33
       - C. Inspection 33
       - D. Reassembly 34
   - 3.3 **Left Crankcase Cover** 34
     - 1. Left crankcase cover 34
       - A. Construction 34
       - B. Disassembly 35
       - C. Reassembly 35
     - 2. A.C. generator 35
       - A. Construction 35
       - B. Disassembly 36
       - C. Reassembly 36

3. Starting sprocket and clutch 36
A. Construction 36
B. Disassembly and reassembly (Starting clutch) 36
C. Disassembly and reassembly (Starting sprocket) 37
4. Clutch adjuster and neutral switch rotor 37
A. Operation 37
B. Disassembly and reassembly (Clutch adjuster) 37
C. Disassembly and reassembly (Neutral switch rotor) 37

3.4 Right Crankcase Cover Assembly 38
1. Right crankcase cover 38
A. Construction 38
B. Reassembly 38
2. Clutch 38
A. Description and operation 38
B. Disassembly 39
C. Inspection 40
D. Reassembly 40

3.5 Oil Pump, Filter and Separator 40
1. Oil pump 40
A. Description 40
B. Disassembly 42
C. Inspection 43
D. Reassembly 43
2. Oil filter 44
A. Description 44
B. Disassembly 44
C. Reassembly 44
3. Oil separator 44
A. Operation 44

3.6 Crankcase 44
A. Description 44
B. Disassembly 45
C. Inspection 45
D. Reassembly 45

3.7 Crankshaft, Connecting Rods and Pistons 45
A. Construction 45
B. Disassembly 46
C. Inspection 46
2. Connecting rods 47
A. Description 47
B. Inspection 47
3. Piston 48
A. Description 48
B. Disassembly 48
C. Inspection 49
D. Reassembly 50
4. Piston rings 50
A. Construction 50
B. Inspection 50
C. Replacing the piston rings 52

3.8 Cam Chain Tensioner and Cam Chain Guide Roller 52
A. Operation 53
B. Disassembly 53

C. Inspection 53
D. Reassembly 53
E. Cam chain tension adjustment 53
3.9 Transmission 54
A. Description 54
B. Disassembly 56
C. Inspection 56
D. Reassembly 56
3.10 Gear Shift 57
A. Operation 57
B. Disassembly 57
C. Inspection 58
D. Reassembly 58
3.11 Kick Starter 58
A. Construction 59
B. Disassembly 59
C. Inspection 59
D. Reassembly 59
3.12 Carburetor (CD175) 60
A. Construction 60
Function of the main components 62
Adjustment 64
Engine (CD125, CD125A, SS125A, CL125A)
3.1 Engine Removal and Installation 70
A. Engine description 70
B. Removal 70
C. Installation 71
3.2 Cylinder Head and Cylinder 72
1. Cylinder head, cover and breather 72
A. Construction 72
B. Disassembly 72
C. Inspection 72
D. Reassembly 73
2. Camshaft 74
A. Construction 74
B. Disassembly 75
C. Inspection 75
D. Reassembly 76
3. Rocker arm 76
A. Construction 76
B. Disassembly 76
C. Inspection 76
D. Reassembly 77
4. Valve 77
A. Construction 77
B. Disassembly 77
C. Inspection 77
D. Reassembly 78
5. Valve seat 78
A. Description 78
6. Cylinder 78
A. Construction 78
B. Disassembly 78

C. Inspection 79
D. Reassembly 79
3.3 Left Crankcase Cover 79
1. Left crankcase cover 79
2. A.C. generator 79
A. Construction 79
B. Disassembly 79
C. Reassembly 80
3. Clutch lifter thread 80
A. Description 80
B. Disassembly 80
C. Reassembly 80
4. Cam chain tensioner 81
A. Construction 81
B. Disassembly 81
C. Inspection 81
D. Reassembly 82
3.4 Right Crankcase Cover Assembly 82
1. Right crankcase cover 82
A. Construction 82
B. Disassembly 82
C. Reassembly 82
2. Clutch 83
A. Description and operation 83
B. Disassembly 83
C. Inspection 84
D. Reassembly 84
3. Oil pump 85
A. Description 85
B. Disassembly 85
C. Inspection 85
D. Reassembly 85
4. Oil filter 86
A. Operation 86
B. Disassembly 86
C. Reassembly 86
3.5 Crankcase 86
1. Upper and under crankcase 86
A. Description 86
B. Disassembly 86
C. Inspection 86
D. Reassembly 87
2. Oil separator 87
A. Description 87
B. Disassembly 87
C. Reassembly 87
3.6 Crankshaft 87
A. Construction 87
B. Disassembly 87
C. Inspection 88
D. Reassembly 88
2. Connecting rods 88
A. Description 88

3. Piston 88
A. Description 88
B. Disassembly 88
C. Inspection 88
D. Reassembly 89
4. Piston Rings 89
B. Inspection 89
C. Replacing the piston rings 89
3.7 Transmission 90
A. Description 90
C. Inspection 91
3.8 Gear Shift 91
A. Description 91
B. Disassembly 92
C. Inspection 93
D. Reassembly 93
3.9 Kickstarter 94
A. Description 94
B. Disassembly 94
C. Inspection 94
D. Reassembly 94
3.10 Carburetor (CD125, CD125A, SS125A, CL125A) 95
Design 95
1. Air flow 95
2. Fuel system 96
3. Float chamber 96
4. Accessories for starting 97
Function of the main Components 97
1. Main jet 97
2. Air jet 97
3. Needle jet 98
4. Jet needle 98
5. Throttle valve 98
6. Slow jet 98
7. Air screw 98
8. Functional range of the respective components 98
Adjustment 98
1. High speed adjustment 98
2. Intermediate speed adjustment 99
3. Slow speed adjustment 99
4. Fuel level adjustment 100
Installation of the CD175 Kick Starter Arm 101
4. FRAME
4.1 Steering Handle 102
A. Description 102
B. Disassembly 102
C. Inspection 103
D. Reassembly 103
4.2 Front Cushion 104
A. Description 104
B. Disassembly 105
C. Inspection 106
D. Reassembly 107
4.3 Steering Stem and Steering Handle Lock 108
A. Construction 108
B. Disassembly 108

C. Inspection 109
D. Reassembly 109
4.4 Fuel Tank 109
A. Construction 109
B. Disassembly 110
C. Inspection 110
D. Reassembly 110
4.5 Frame Body 111
A. Construction 111
B. Disassembly 111
C. Inspection 111
D. Reassembly 111
4.6 Air Cleaner Case and Seat 112
A. Construction 112
B. Disassembly 113
C. Inspection 113
D. Reassembly 113
4.7 Stand 113
A. Construction 113
B. Disassembly 114
C. Inspection 114
D. Reassembly 114
4.8 Muffler and Exhaust Pipe 115
A. Construction 115
B. Disassembly 115
C. Inspection 115
D. Reassembly 115
4.9 Rear Fork and Rear Fender 115
A. Construction 115
B. Disassembly 116
C. Inspection 116
D. Reassembly 116
4.10 Rear Cushion 117
A. Construction 117
B. Disassembly 117
C. Inspection 118
D. Reassembly 118
4.11 Front Wheel 118
A. Construction 118
B. Disassembly 118
C. Inspection 119
D. Reassembly 119
4.12 Rear Wheel 120
A. Description 120
B. Disassembly 122
C. Inspection 122
D. Reassembly 123
5. ELECTRIC SYSTEM 126
1. Ignition Circuit 126
A. Ignition coil 127
B. Spark advancer 127
C. Contact breaker 128
D. Condenser 129
E. Spark plug 129
2. Electrical power supply 132
A. A.C. generator 132

3. Selenium rectifier 133
4. Battery 134
A. Construction 134
B. Rating 134
C. Battery servicing 135
D. Battery charging procedure 136
E. Trouble shooting and corrective action 138
5. Various loads 139
A. Headlight 139
B. Tail, stoplight 139
C. Neutral and speedometer lamp 139
6. Starting motor 140
A. Description 140
B. Disassembly 142
C. Inspection 142
D. Reassembly 142
7. Service tester instruction 143

6. PERIODIC ADJUSTMENT
6.1 Maintenance Inspection 148
A. Engine Adjustment 148
1. Measuring compression 148
2. Tappet adjustment 148
3. Ignition timing adjustment 149
4. Contact points 151
5. Spark plug adjustment 151
6. Fuel supply system 152
7. Fuel strainer cleaning 153
8. Oil filter screen cleaning 153
9. Air cleaner servicing 153
10. Carburetor cleaning and adjustment 154
B. Lubricating 154
1. Parts not requiring periodic oil change or lubrication 154
2. Engine oil change 155
C. Drive chain adjustment 155
D. Brake adjustment 156
1. Front brake adjustment 156
2. Rear brake adjustment 156
E. Spoke torquing 156
F. Battery inspection 156
G. Security inspection of parts 158
6.2 Periodic Inspection and Servicing 161

7. TROUBLE SHOOTING 164
1. Main engine troube 164
2. Carburetor troube 166
3. Engine notice 168
4. Steering system 168
5. Clutch system 169
6. Gear change system 169
7. Suspensions 169
8. Brake system 170
9. Drive chain 170

8. WIRING DIAGRAM 171
CD125 wiring diagram 171
CD125A wiring diagram 172
CL/SS125A wiring diagram 173
CD175 wiring diagram 174

1. SPECIFICATIONS

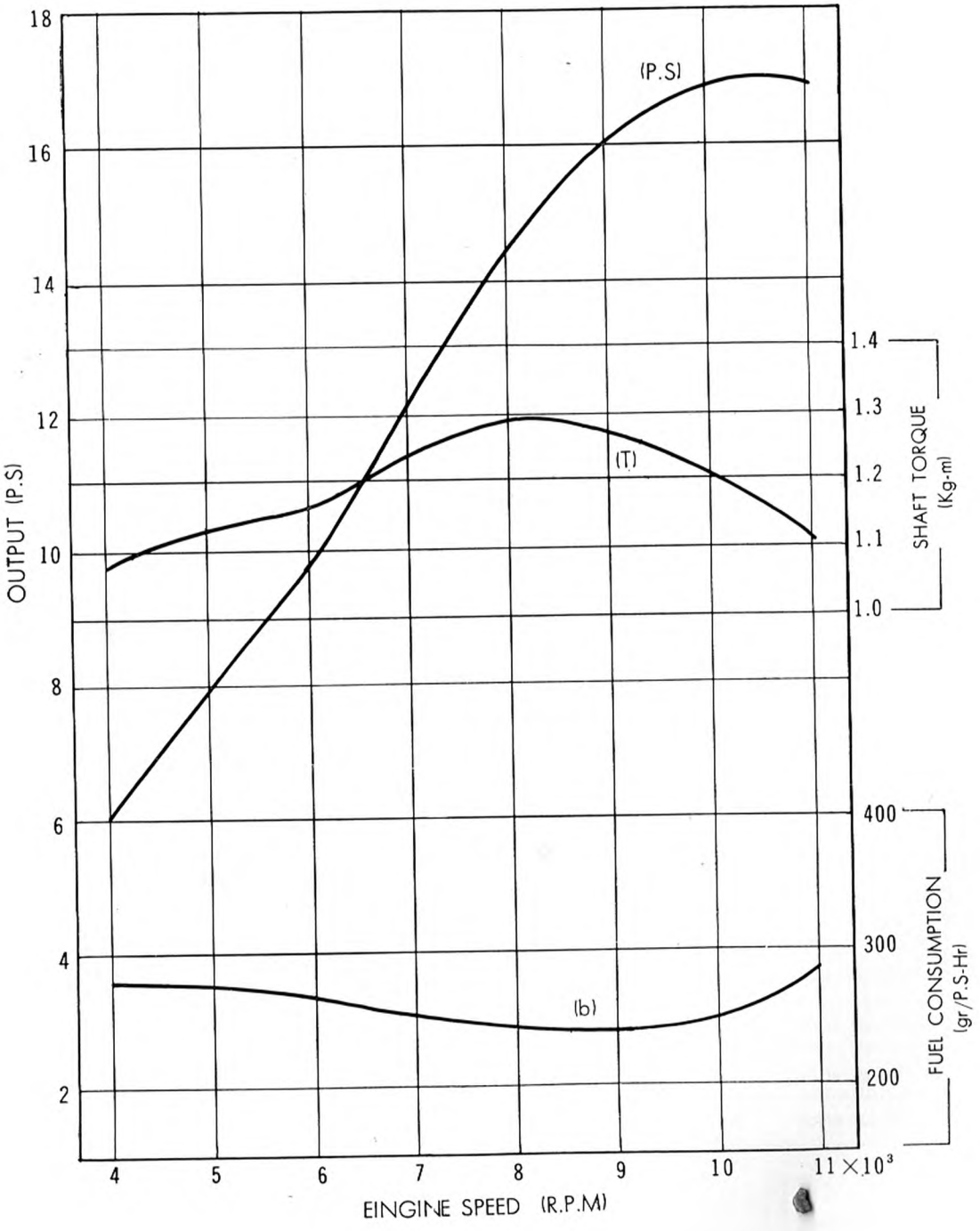
	CD175/CD175A	CD125/CD125A	SS125A/CL125A
Name of Motorcycle	Honda 175	Honda 125	Honda 125
Riders	2	2	2
Manufacturer	Honda Motor Co., Ltd., Hamamatsu Factory	Same as left	Same as left
Dimension			
Overall length	1,870 mm (73.7 in)	Same as left	73.60 in (1,869 mm)
Overall width	755 mm (29.7 in)	720 mm (28.3 in)	CL125A: 34.65 in (80 mm) SS125A: 28.50 in (723 mm)
Overall height	CD175: 1,040 mm (40.9 in) CD175A: 950 mm (37.4 in)	975 mm (38.4 in)	CL125A: 40.90 in (1,040 mm) SS125A: 34.45 in (875 mm)
Wheelbase	1,250 mm (49.2 in)	Same as left	Same as left
Min. ground clearance	135 mm (5.3 in)	Same as left	5.71 in (145 mm)
Weight			
Weight, empty	CD125: 121 kg (266.80 lbs) CD125A: 118 kg (260.19 lbs)	106 kg (233.73 lbs)	CL125A: 231 lbs (105.0 kg) SS125A: 235 lbs (107.0 kg)
Empty weight distribution, front	CD175: 56 kg (123.48 lbs) CD175A: 54 kg (119.07 lbs)	49 kg (108.05 lbs)	CL125A: 110 lbs (50.0 kg) SS125A: 107 lbs (48.5 kg)
Empty weight distribution, rear	CD175: 65 kg (143.33 lbs) CD175A: 64 kg (141.12 lbs)	57 kg (125.68 lbs)	124.3 lbs (56.5 kg)
Full load weight distribution, front	CD175: 80 kg (176.4 lbs) CD175A: 78 kg (171.99 lbs)	70.5 kg (155.45 lbs)	CL125A: 160.5 lbs (73.0 kg) SS125A: 156 lbs (71.0 kg)
Full load weight distribution, rear	CD175: 151 kg (332.96 lbs) CD175A: 150 kg (330.75 lbs)	95.0 kg (209.48 lbs)	CL125A: 340 lbs (154.5 kg) SS125A: 117 lbs (144.0 kg)
Performance			
Max. speed	130 km/h (80.7 mile/h)	115 km/h (71 mile/h)	CL125A: 71.5 mile/h (115 km/h) SS125A: 74.5 mile/h (120 km/h)
Braking distance	7 m @ 35 kph (22.96 ft @ 21.74 mph)	Same as left	34.5 ft @ 31.1 mph (10.5 m @ 50 kph)
Fuel consumption	55 km/lit @ 40 kph (129.0 mile/US gallon, 155.3 mile/Imp gallon @ 24.84 mph)	65 km/lit @ 40 kph (135 mile/US gallon, 183 mile/Imp gallon @ 24.84 mph)	Same as left
Climbing ability	18.5°	18°10′	Same as left
Min. turning radius	1,950 mm (76.8 in)	Same as left	Same as left
Engine			
Name and Model	Honda CD175E	Honda CD125E	Honda SS125AE Honda CL125AE
Type fuel used	Gasoline	Same as left	Same as left
Type engine	Air cooled 4 stroke cycle	Same as left	Same as left
No. of cylinder and arrangement	Twin, 30° inclined from vertical	Same as left	Same as left
Valve arrangement	Overhead Camshaft	Same as left	Same as left
Total piston displacement	174 cc (10.65 cu in)	124 cc (7.56 cu in)	Same as left
Bore × Stroke	52 × 41 mm (2.047 × 1.615 in)	44 × 41 mm (1.732 × 1.614 in)	Same as left

	CD175/CD175A	CD125/CD125A	SS125A/CL125A
Compression ratio	9.0 : 1	9.4 : 1	9.4 : 1
Compression pressure	10 kg/cm² (142.3 lb/in²)	Same as left	Same as left
Max. output	17.0 PS @ 10,500 rpm	12.5 PS @ 10,000 rpm	13.0 PS/10,500 rpm
Max. torque	1.29 kg-m (9.3 ft lb) @ 8,000 rpm	0.94 kg-m (6.8 ft lb) @ 8,500 rpm	6.72 ft. lb/9000 rpm (0.93 kgm/9000 rpm)
Min. fuel consumption at max. load	240 gr/PS-h/8,000 rpm	245 gr/PS-h/8,000 rpm	Same as left
Dimension	460×356×417 mm (18.11×14.02×16.42 in)	432×443×421 mm (17.0×17.45×16.55 in)	17.01 in (l) 17.44 in (w) 16.58 in (h) (432 mm×443 mm×421 mm)
Total weight	CD175: 38 kg (83.79 lbs) CD175A: 36 kg (79.38 lbs)	CD125 : 36 kg (79.38 lbs) CD125A : 32.5 kg (71.5 lbs)	71.5 lbs (32.5 kg)
Installation method	On frame center bolted from bottom	Same as left	Same as left
Starting method	CD175: Kick starter, starting motor CD175A: Kick starter	CD125 : Kick starter, starting motor. CD125A : Kick starter	Kick starter
Fuel System			
Carburetor No. and type	Piston valve double float PW-22/1 ea	Vacuum type CVC21HA 1 ea	Same as left
Manufacturer	Keihin Seiki	Same as left	Same as left
Air filter type	Dry filter element	Same as left	Same as left
Manufacturer			
Fuel tank capacity	10.0 lit (2.64 US gallon, 2.2 Imp gallon	9.5 lit (2.5 US gallon, 2.1 Imp gallon)	CL125A: 2.5 US gal (9.5 lit) SS125A: 2.2 US gal (8.2 lit)
Lubrication System			
Lubricating method	Pressure & wet sump	Same as left	Same as left
Type pump	Plunger	Same as left	Same as left
Type oil filter	Centrifugal & filtering mesh	Same as left	Same as left
Lubrication system capacity	1.5 lit (3.17 US pints, 2.64 Imp pts)	1.2 lit (2.5 US pts, 2.1 Imp pts)	2.5 US pts (1.2 lit)
Ignition System			
Ignition method	Battery	Same as left	Same as left
Type ignition coil	29700-1B4-0 CM62-01	SR256 • 29700-134-0	29700-134-0
Manufacturer	Nippon Denso Hitachi	Kokusan Denki Nippon Denso	Nippon Denso
Type spark plug	D-8HS X-22FS	D-6HS X-22FS	NGK D-10HS
Manufacturer	Nippon Tokushu Togyo Nihon Denso	Nihon Tokushu Togyo Nippon Denso	Same as left
Electrical System			
Type Battery	CD175: B54-6 CD175A : B41-6	CD125 : B41-6 CD125A : B36-6	B54-6
Volt and AH	CD175: 6V-12AH CD175A : 6V-10.5AH	CD125 : 6V-10.5AH CD125A : 6V-6AH	6V-12AH
Manufacturer	Yuasa Denchi	Same as left	Same as left
Type generator	Rotor type A.C. generator	Same as left	Same as left

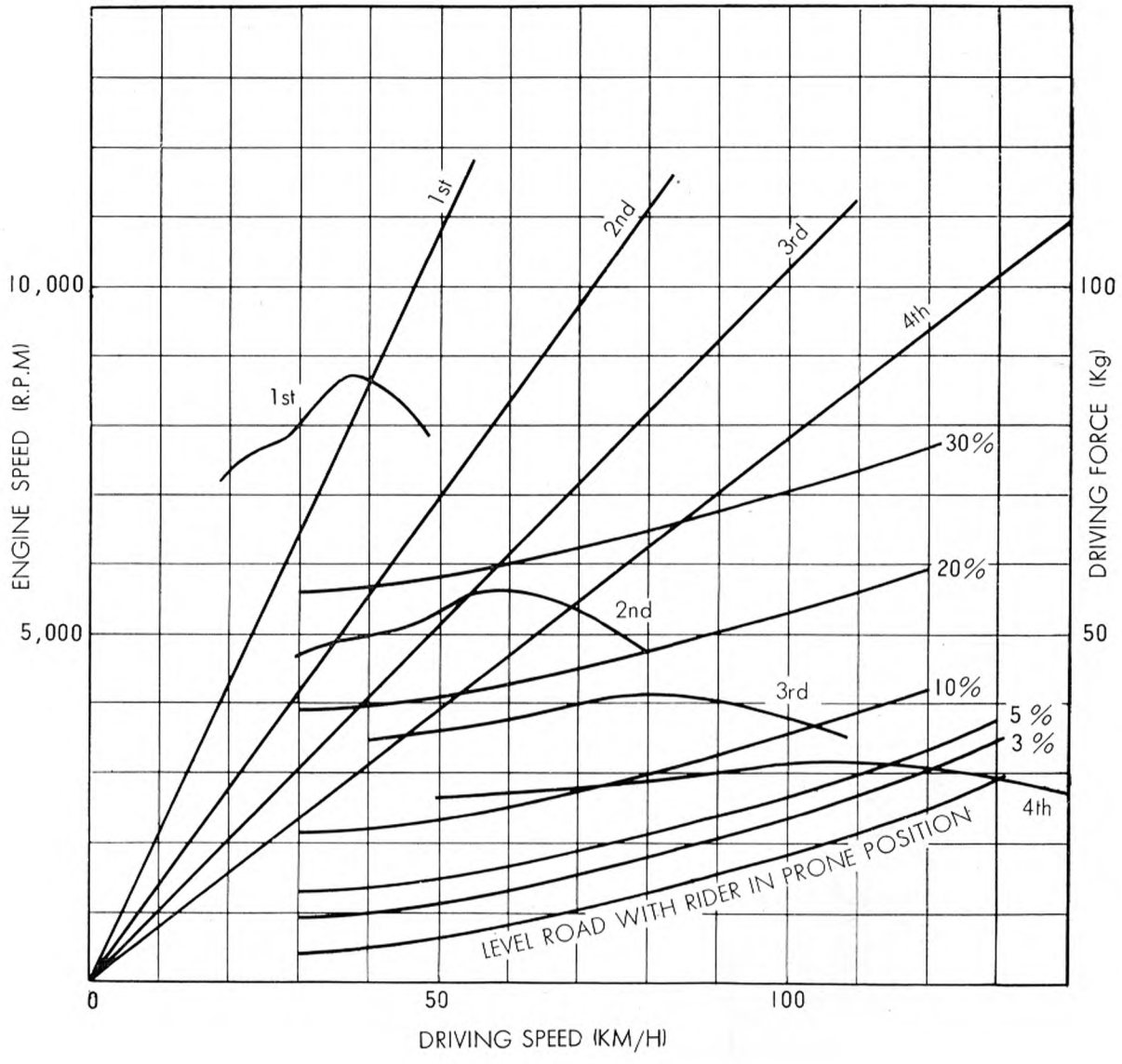
	CD175/CD175A	CD125/CD125A	SS125A/CL125A
Power Transmission System			
Primary reduction method	Gear	Same as left	Same as left
Reduction ratio	3.700	3.875	3.875
Clutch type	Wet multiple disc type	Same as left	Same as left
Type transmission	Constant meshed gears	Same as left	Same as left
Gear change method	Left foot operated return type	Same as left	Same as left
Gear ratio, 1st gear	2.769	2.615	2.615
Gear ratio, 2nd gear	1.778	1.611	1.611
Gear ratio, 3rd gear	1.318	1.190	1.190
Gear ratio, 4th gear	1.040	0.880	0.917
Secondary reduction method	Chain	Same as left	Same as left
Reduction ratio	2.176	2.800	2.800
Steering System			
Steering handle turning radius	43°	Same as left	Same as left
Steering handle width	CD175 : 690 mm (27.1 in) CD175A : 620 mm (22.4 in)	655 mm (25.8 in)	CL125A : 29.9 in (760 mm) SS125A : 25.8 in (655 mm)
Caster	64°	Same as left	Same as left
Trail	85 mm (3.35 in)	Same as left	3.38 in (86 mm)
Tire, front	3.00–16 (4 PR)	Same as left	2.75–17 (4 PR)
Tire, rear	3.00–16 (4 PR)	Same as left	2.75–17 (4 PR)
Brake System			
Type brake, front	Internal expanding shoe	Same as left	Same as left
Type brake, rear	Internal expanding shoe	Same as left	Same as left
Method of application, front	Right hand lever operated	Same as left	Same as left
Method of application, rear	Right foot pedal operated	Same as left	Same as left
Suspension System			
Suspension method, front	Telescopic type	Same as left	Same as left
Suspension method, rear	Swing arm type	Same as left	Same as left
Dampening system, front	Hydraulic	Same as left	Same as left
Dampening system, rear	Hydraulic	Same as left	Same as left
Frame type	Backbone type	Same as left	Same as left

	CD175/CD175A	CD125/CD125A	SS125A/CL125A
Lighting System			
Headlight type	CD175 : 60766–816 Semi shield type CD175A : 60797 Semi shield type	6.0766, 816 Semi shield type	Shield type
Headlight rating	CD175 : 6V–30/25W CD175A : 6V–35/35W	CD125 : 6V–30/25W CD125A : 6V–25/25W	6V–35/25W
Taillight rating	6V–5W	Same as left	Same as left
Taillight combination with	License pate	Same as left	Same as left
Stop light rating	6V–18W	Same as left	Same as left
Turn signal type	Blinking type	Same as left	Same as left
Turn signal rating	CD175 : 6V–10W CD175A : 6V–18W	6V–10W	6V–18W (Optional parts)
Instrument			
Horn type	Electric, swirling type	Same as left	Same as left

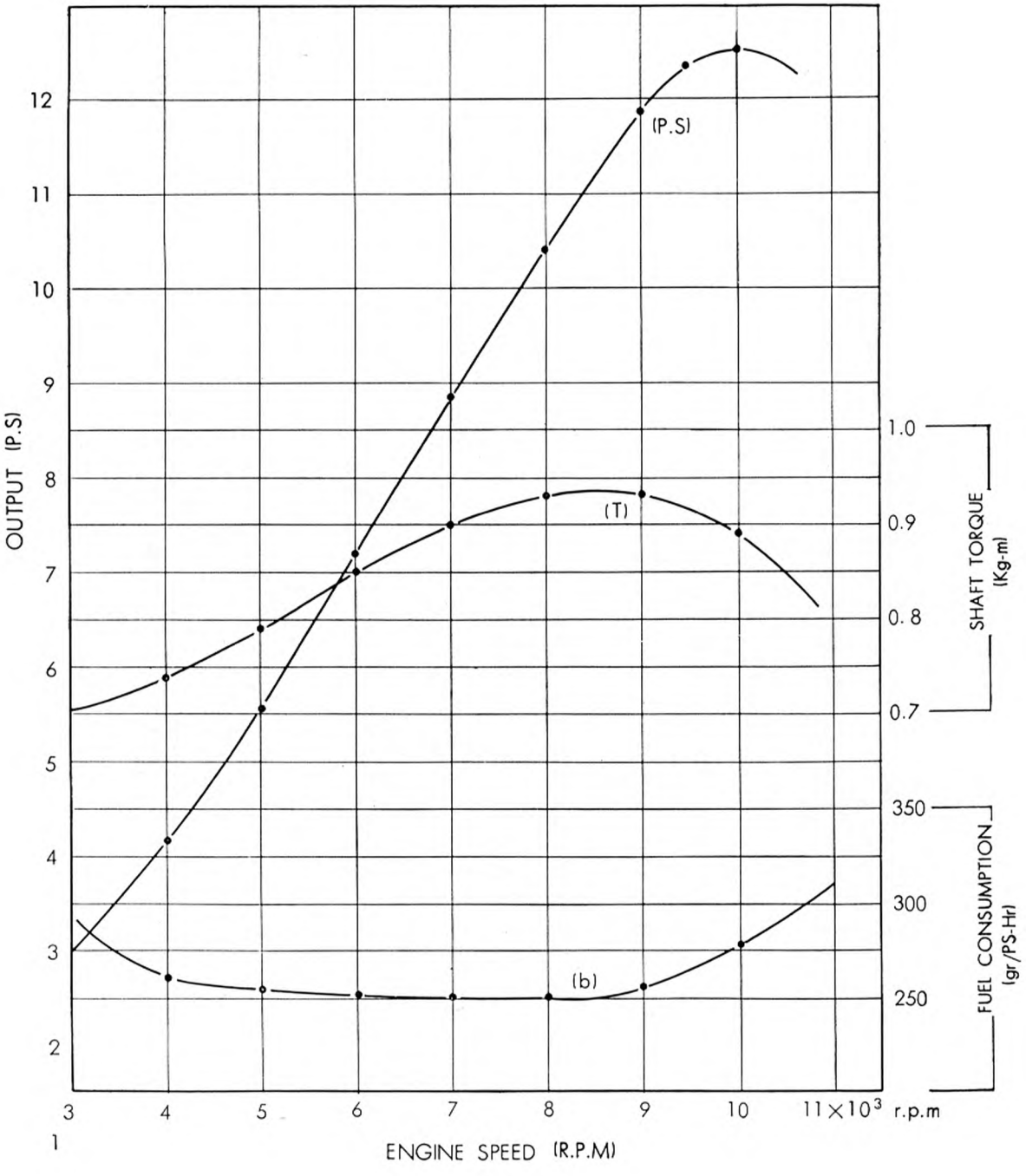
CD175 ENGINE PERFORMANCE CURVE



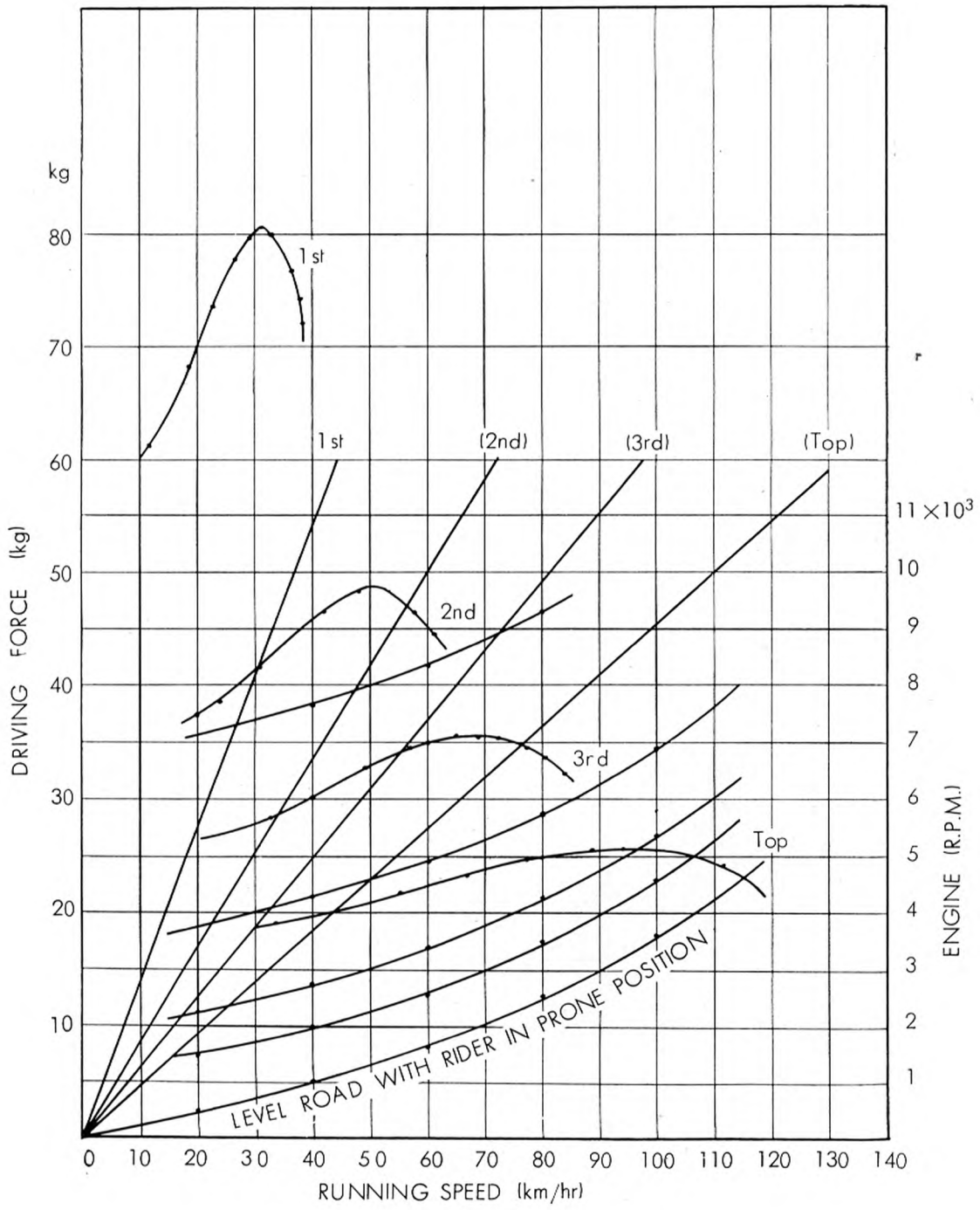
CD175 DRIVING PERFORMANCE CURVE



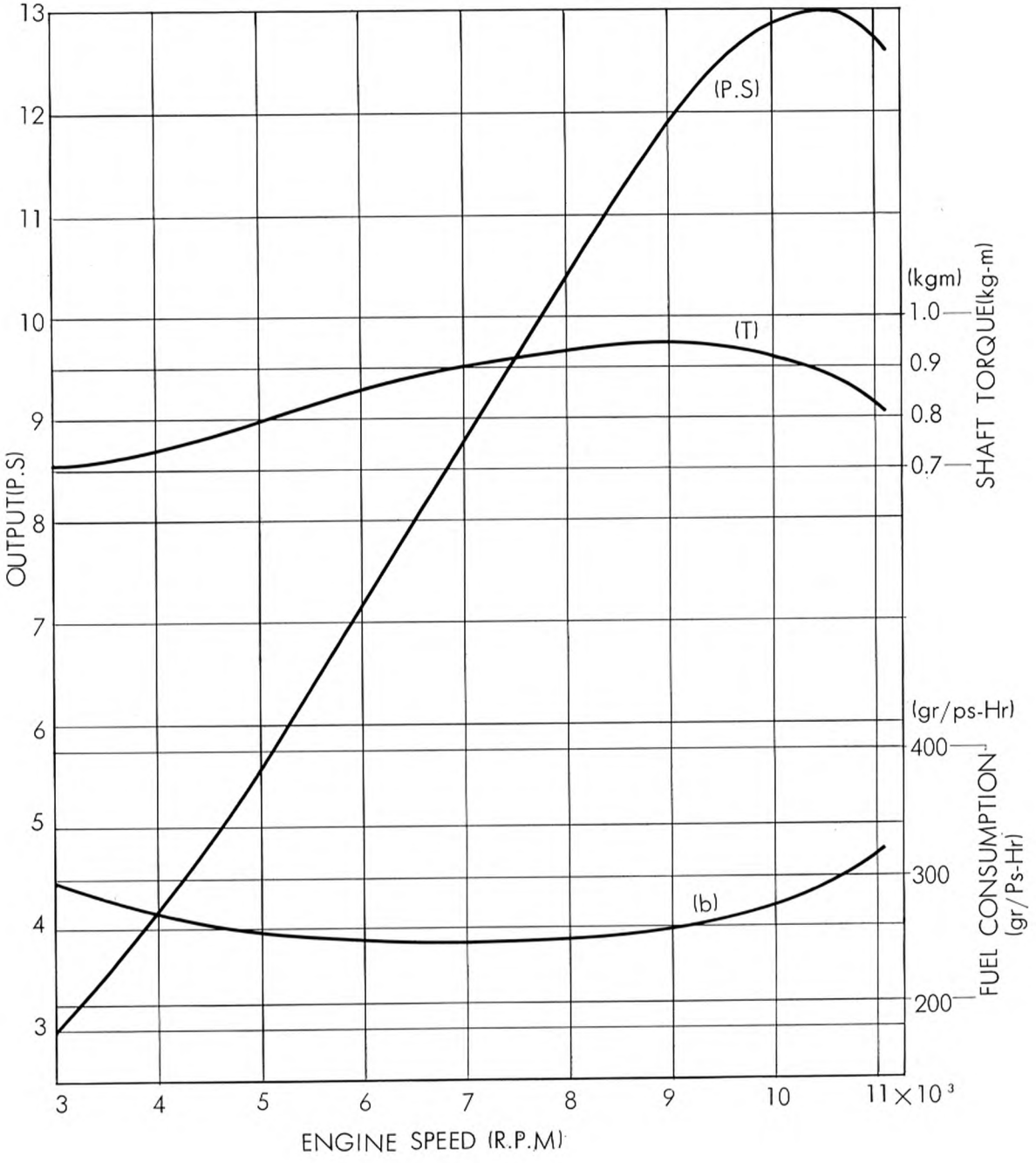
CD125A ENGINE PERFORMANCE CURVE



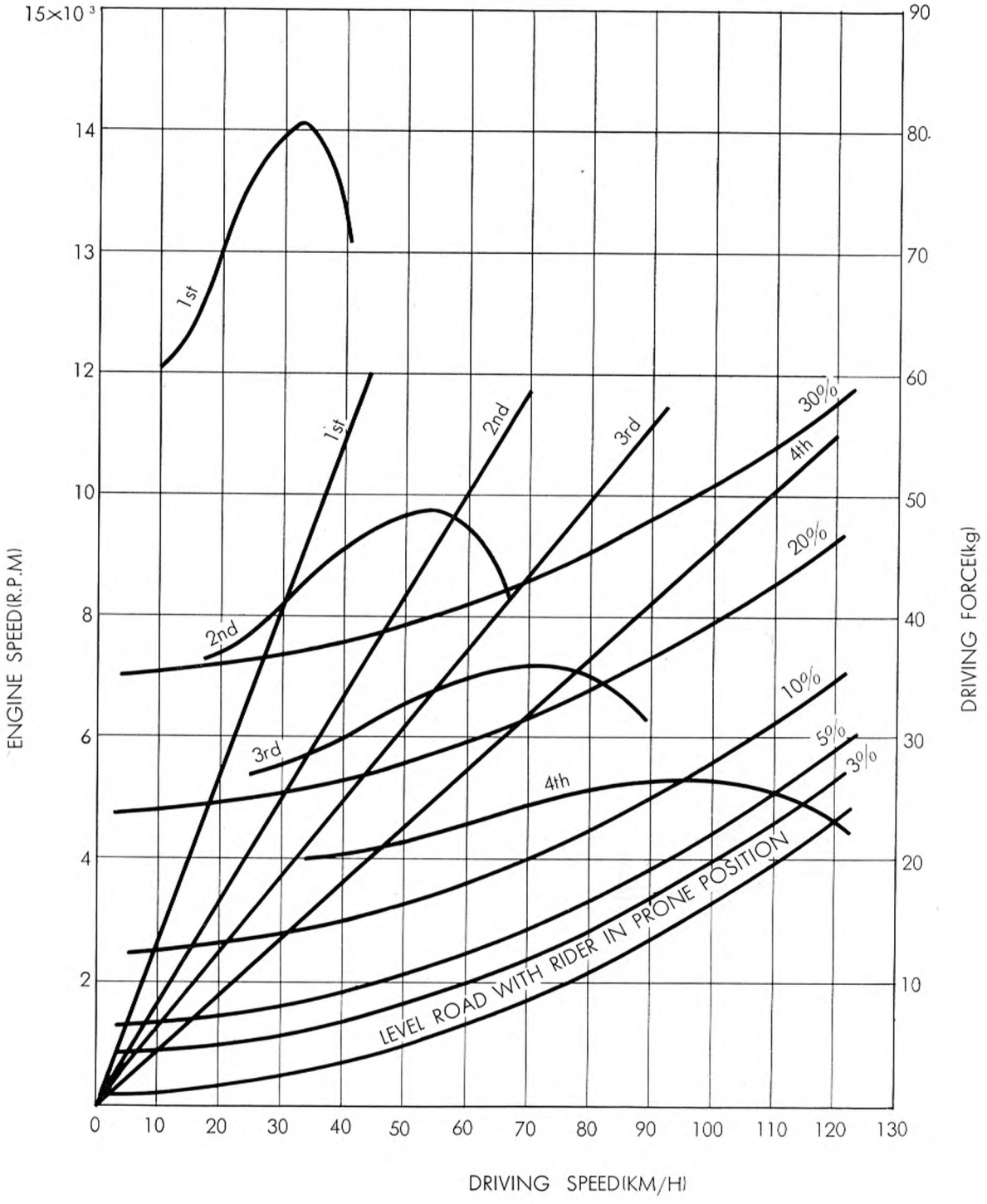
CD125A DRIVING PERFORMANCE CURVE



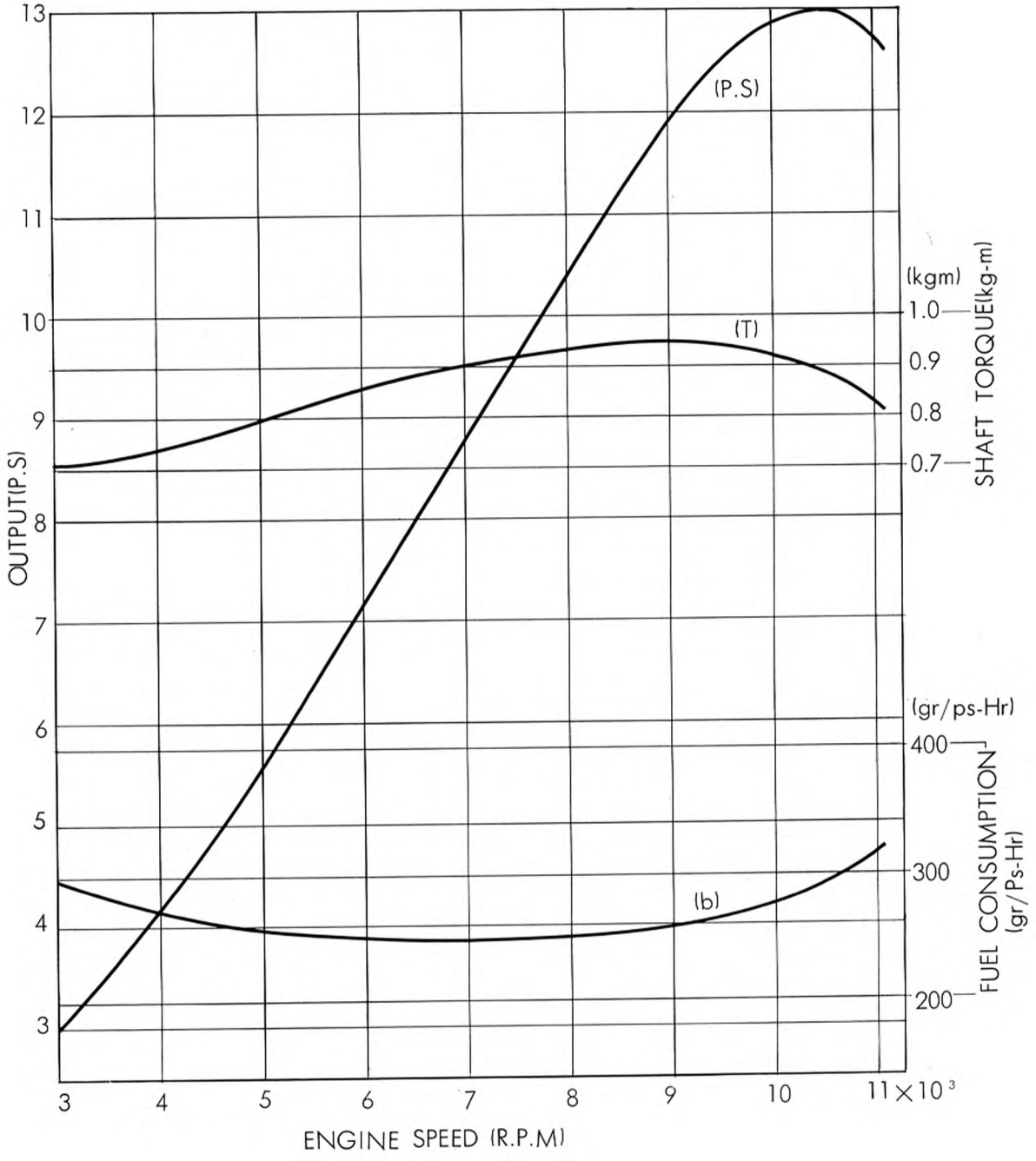
SS125A ENGINE PERFORMANCE CURVE



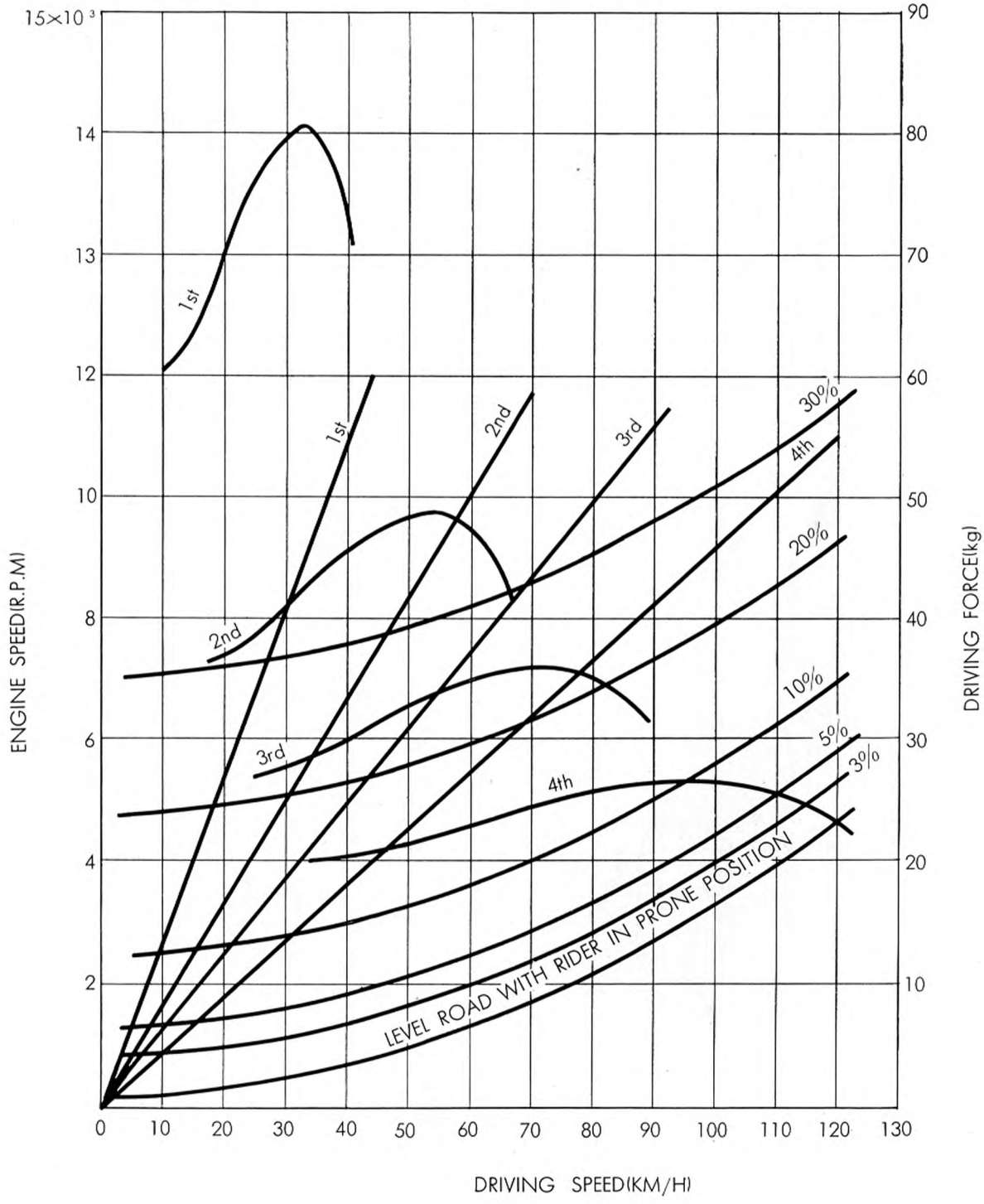
SS125A DRIVING PERFORMANCE CURVE



CL125A ENGINE PERFORMANCE CURVE



CL125A DRIVING PERFORMANCE CURVE



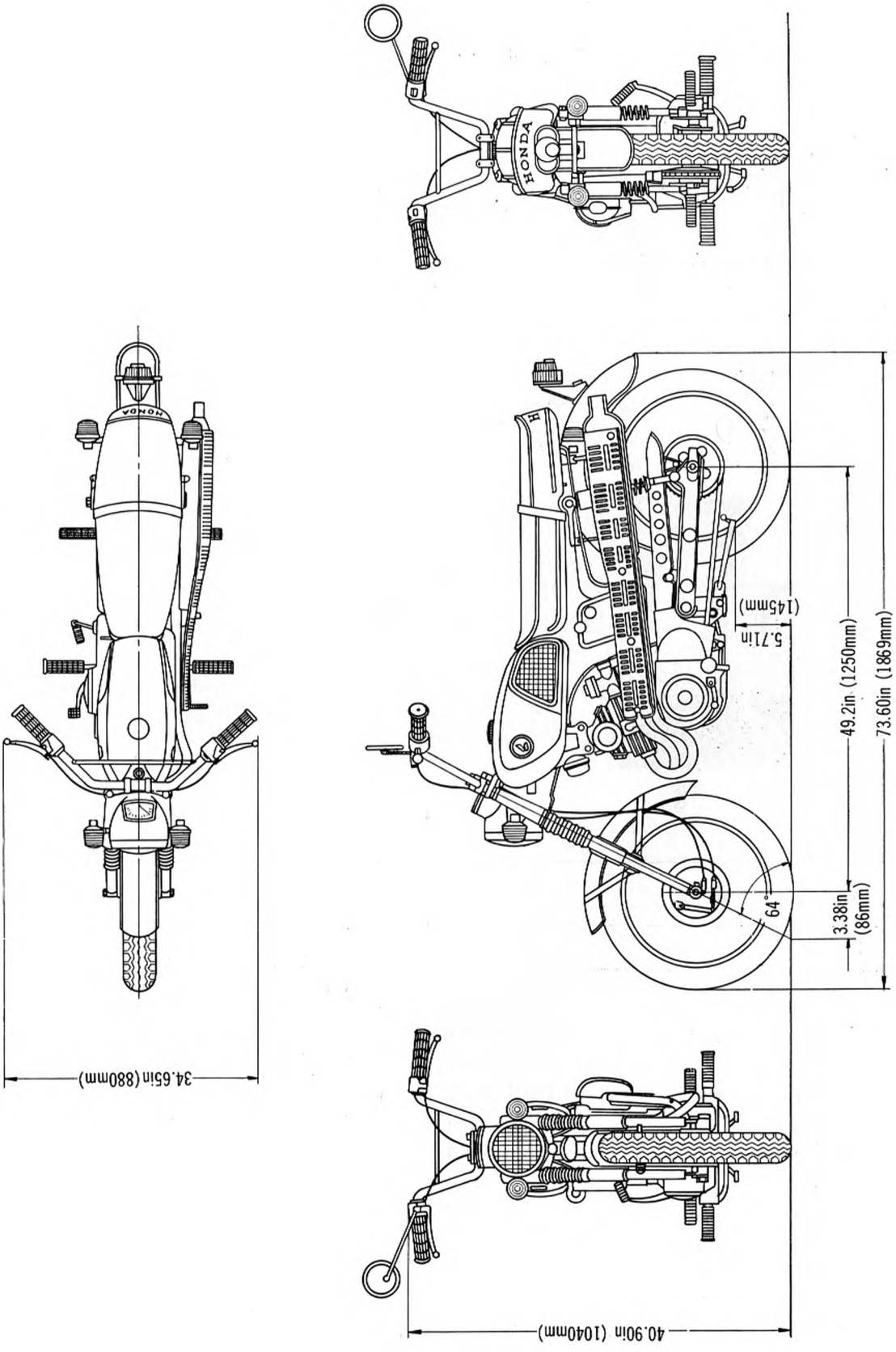
CD175 DIMENSIONAL DRAWING

CD125A

595
(23.4in)
635
(25.0in)
220
(8.7in)
135
(5.3in)
1250(49.2in)
1870(73.6in)
85
(3.4in)
64°
975
(38.4in)
788
(31.0in)
720
(28.4in)
280
(11.0in)

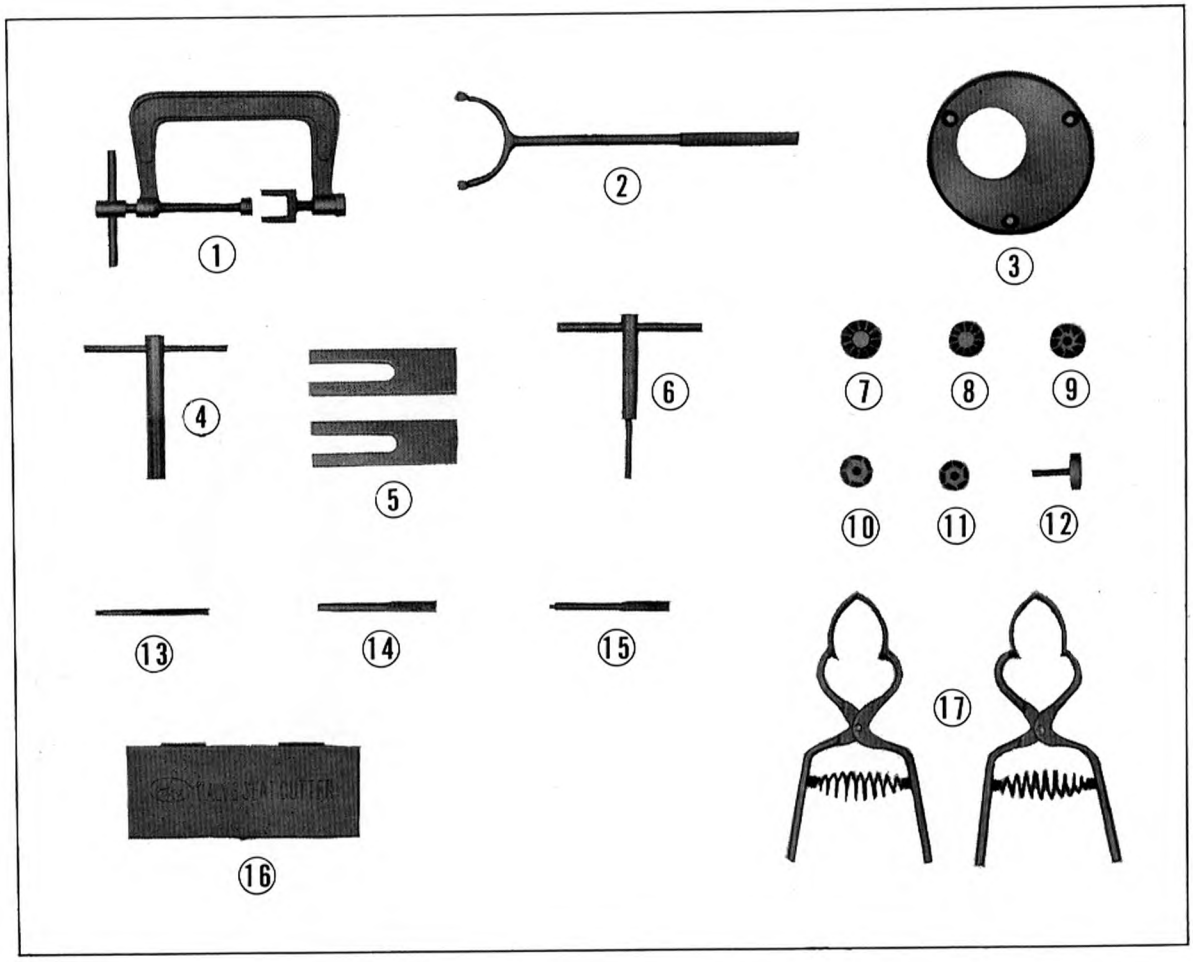
SS125A DIMENSIONAL DIAGRAM

CL125A DIMENSIONAL DIAGRAM



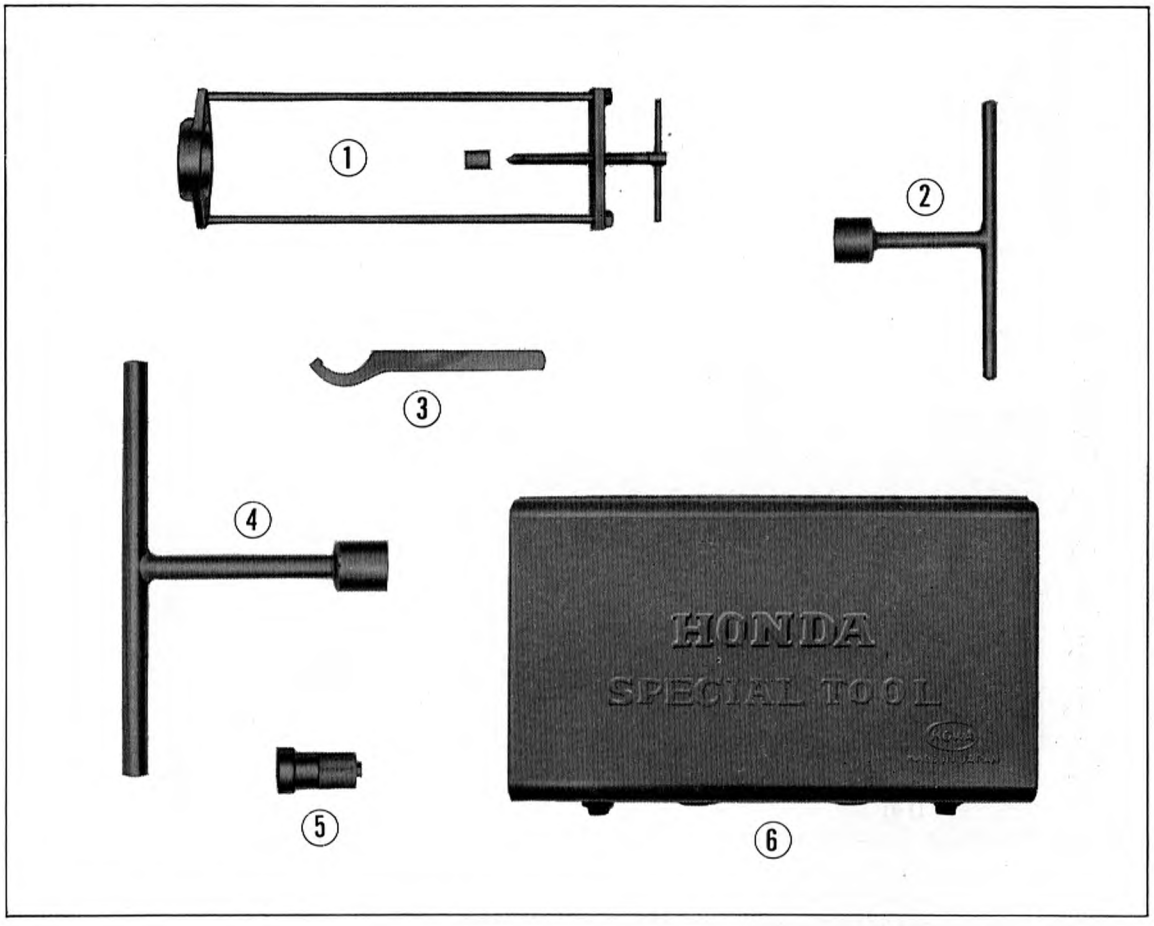
2. SPECIAL TOOLS

Tools Necessary for Disassembly & Reassembly



CD175 ENGINE

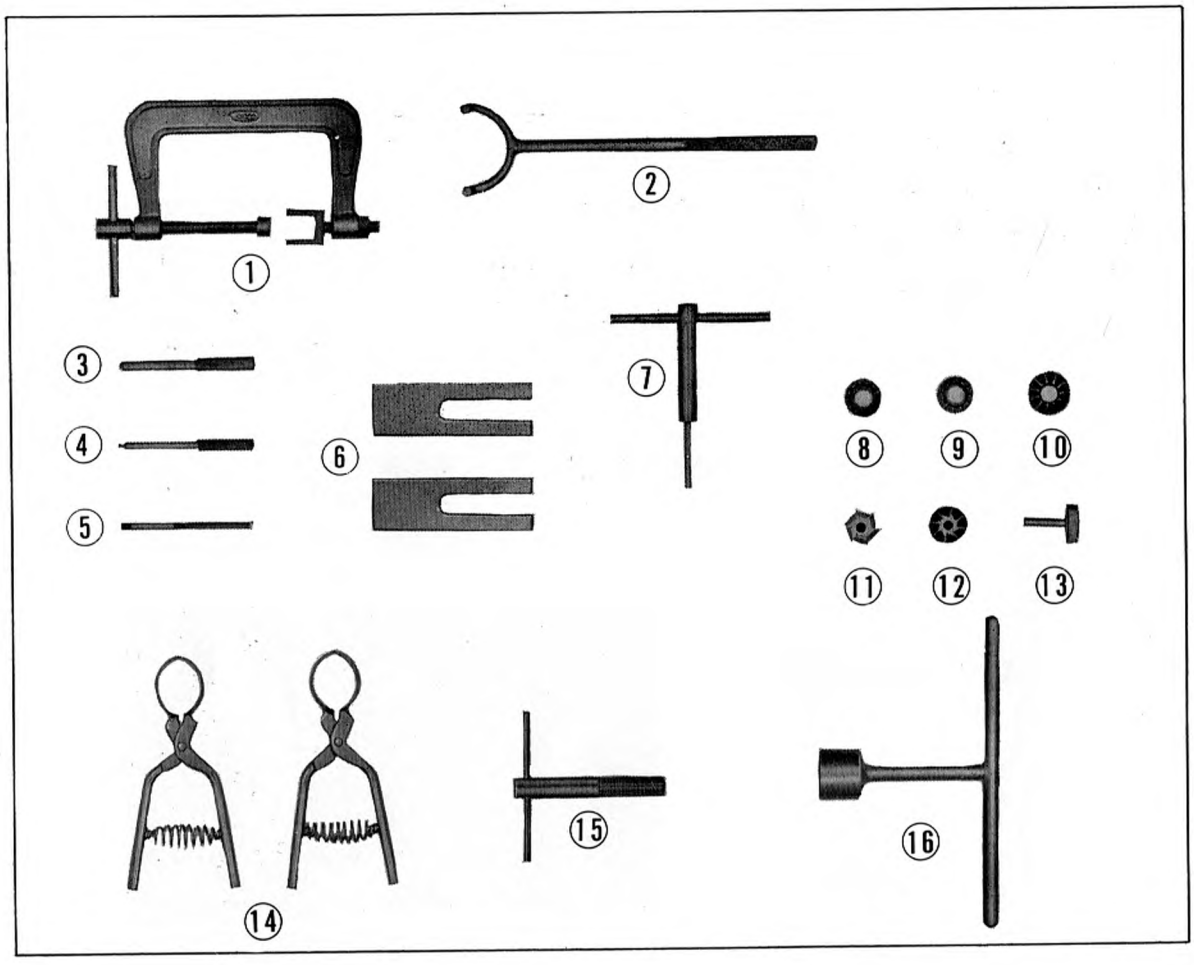
Ref. No.	Description	Tool No.
①	Valve lifter	07031-21601
②	Drive sprocket holder	07022-25901
③	Timing inspection cover	07061-21601
④	T-handle dynamo rotor puller	07011-21601
⑤	Piston base	07033-25001
⑥	Valve seat cutter holder	07007-23501
⑦	Inlet valve seat flat surface cutter	07003-23501
⑧	Exhaust valve seat flat surface cutter	07004-23501
⑨	Valve seat face cutter, 90°	07001-23501
⑩	Inlet valve seat interior cutter	07005-23501
⑪	Exhaust valve seat interior cutter	07006-23501
⑫	Tappet adjusting box wrench	07081-70301
⑬	Valve guide reamer	07008-24001
⑭	Valve guide driver	07046-21601
⑮	Valve guide remover	07047-04001
⑯	Valve seat cutter case	07997-23501
⑰	Piston ring compressor	07032-23501



CD175 FRAME

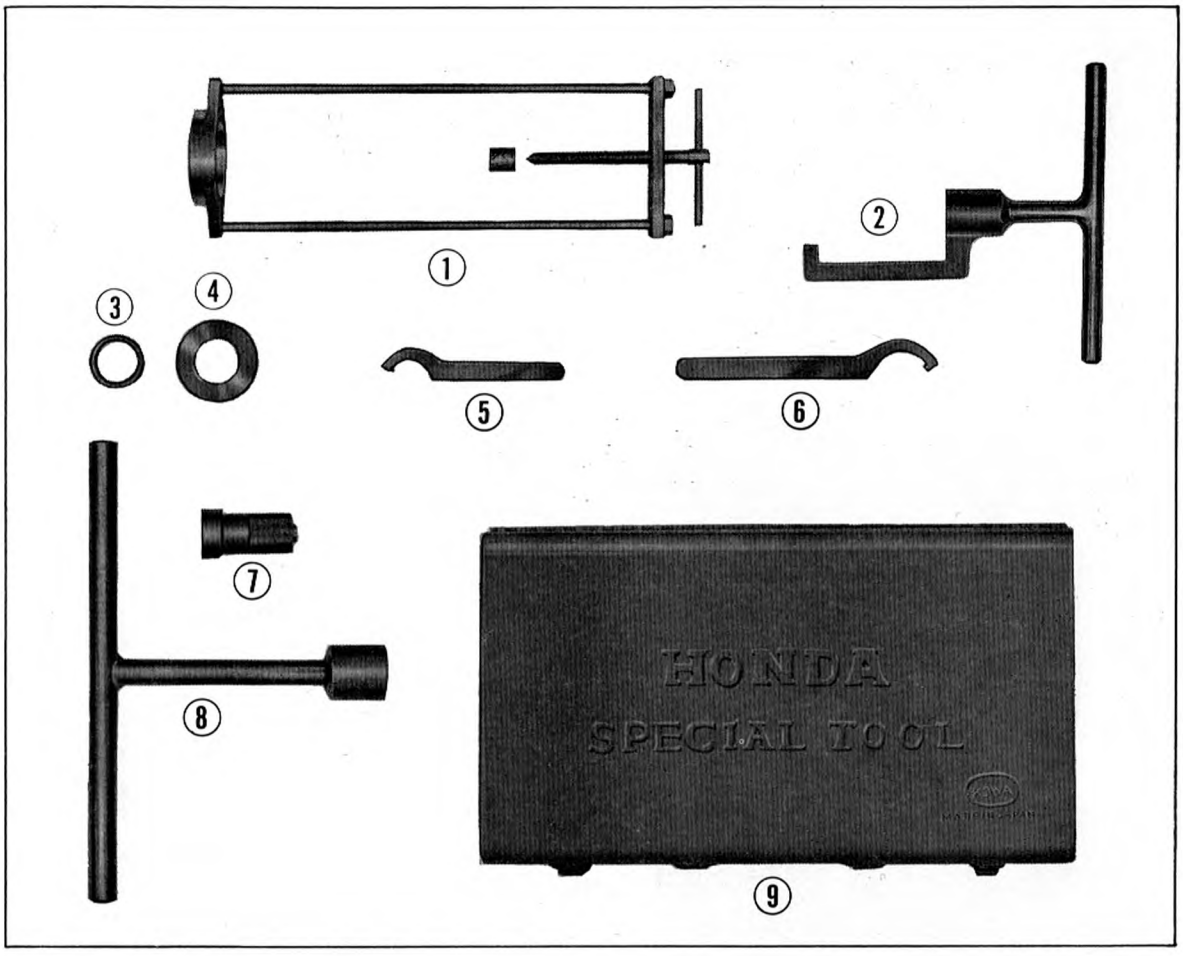
Ref. No.	Description	Tool No.
①	Rear cushion disassembling & assembling tool	07035-23701
②	Lock nut box wrench, 16 mm	07086-24001
③	48 mm pin spanner	07072-20001
④	29 mm stem nut T-handle wrench	07083-21601
⑤	Bearing driver	07048-21601
⑥	Tool case	07790-99910

This model is not applied ISO threads (modified JIS).



CD125/CD125A/SS125A/CL125A ENGINE

Ref. No.	Description	Tool No.
①	Valve lifter	07031–21601
②	Drive sprocket holder	07022–20001
③	Valve guide driver	07046–21601
④	Valve guide remover	07047–04001
⑤	Valve guide reamer	07008–24301 (SS125A/CL125A) 07008–24001 (CD125/CD125A)
⑥	Piston base	07033–25001
⑦	Valve seat cutter holder	07007–04001 (SS125A/CL125A) 07007–21601 (CD125/CD125A)
⑧	Exhaust valve seat flat surface cutter	07004–24001
⑨	Inlet valve seat flat surface cutter	07003–24001
⑩	Inlet valve seat face cutter 90°	07001–24001
	Exhaust valve seat face cutter 90°	07002–24001
⑪	Inlet valve seat interior cutter	07005–21601
⑫	Exhaust valve seat interior cutter	07006–21601
⑬	Tappet adjusting box wrench	07081–24301 (SS125A/CL125A) 07081/70301 (CD125/CD125A)
⑭	Piston ring compressor	07032–20001
⑮	T–handle dynamo rotor puller	07011–20001
⑯	16 mm lock nut box wrench	07086–24001



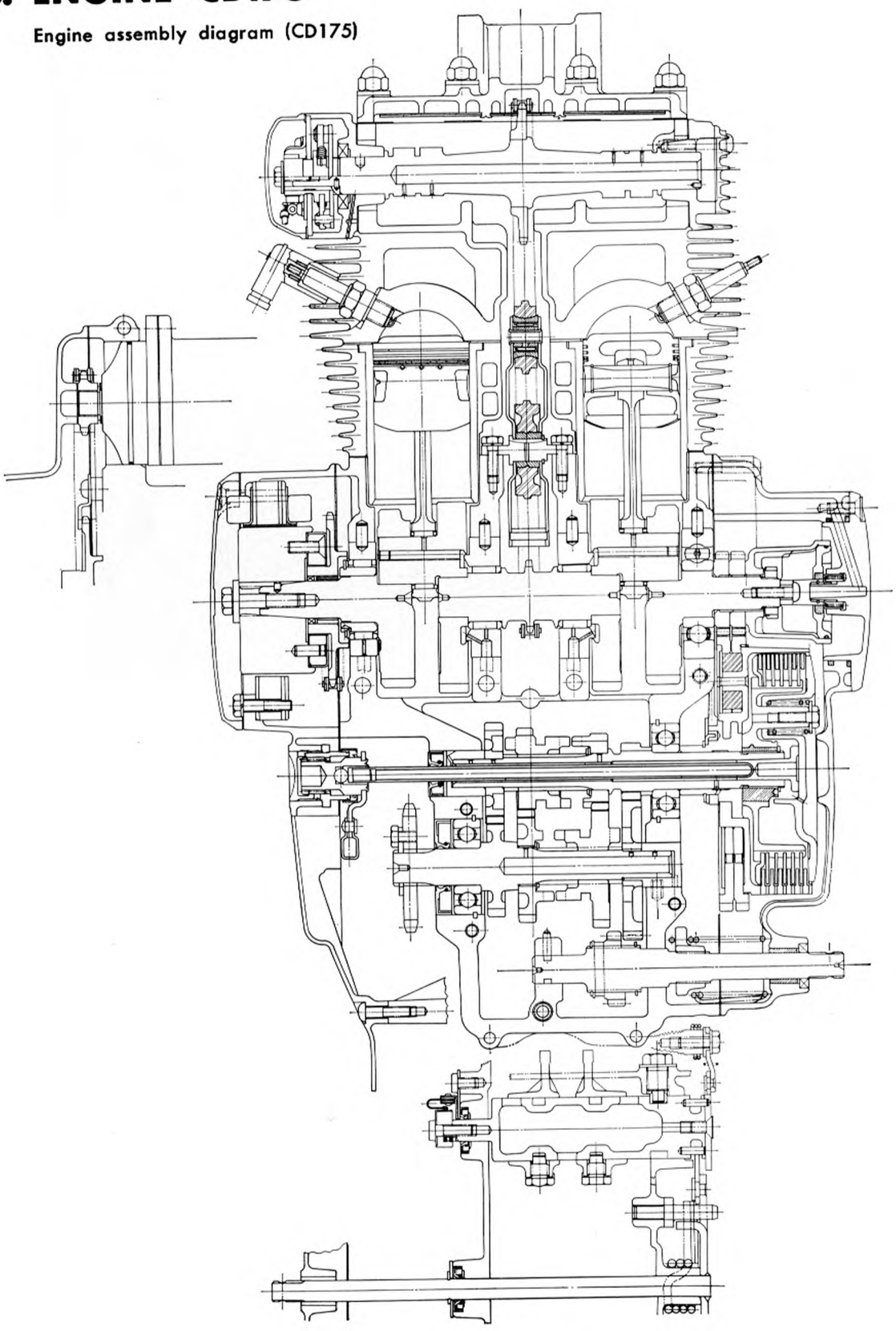
CD125/CD125A/SS125A/CL125A FRAME

Ref. No.	Description	Tool No.
①	Rear cushion disassembling & assembling tool	07035-24301 (SS125A/CL125A) 07035-24201 (CD125/CD125A)
②	Kick starter spring slider	07045-23001
③	Front oil seal driving guide	07054-23003
④	Front oil seal driving weight	07054-21602
⑤	Main switch pin spanner	07071-25001
⑥	46 mm pin spanner	07072-24001
⑦	Bearing driver	07048-24001
⑧	29 mm stem nut T-handle box wrench	07083-21601
⑨	Tool case	07790-99910
	Valve seat cutter case	07997-23001

This model is not applied ISO threads (modified JIS).

3. ENGINE - CD175

Engine assembly diagram (CD175)

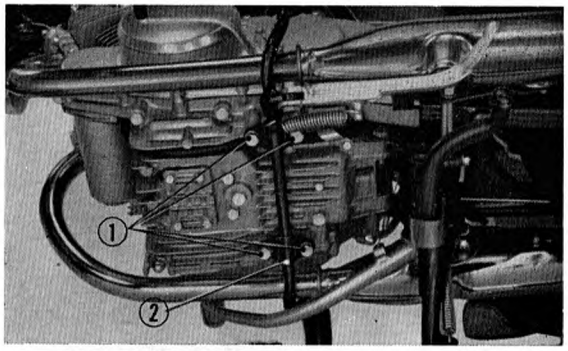


3.1 ENGINE REMOVAL AND INSTALLATION

A. Engine Construction

All of the models incorporate the O.H.C. design, driven from the center of the engine by a lightweight chain. This provides the engine with high speed and high power output due to the elimination of the reciprocating movements mechanical losses, and reduction in weight. Further the chain is always maintained in a constant tension by the spring operated automatic tensioner to assure quiet operation and precise valve timing at all speeds.

The lubrication system utilizes a plunger type oil pump, driven through the transmission main shaft to provide lubrication under pressure to all of the primary moving parts of the engine and in conjunction, a screen and a centrifugal filter are incorporated in the system to assure that only highly purified oil is circulated within the engine to minimize the parts wear and attributing to the extended engine life.



① 8×25 bolt ② Step
Fig. 3-1. Step mounting bolt

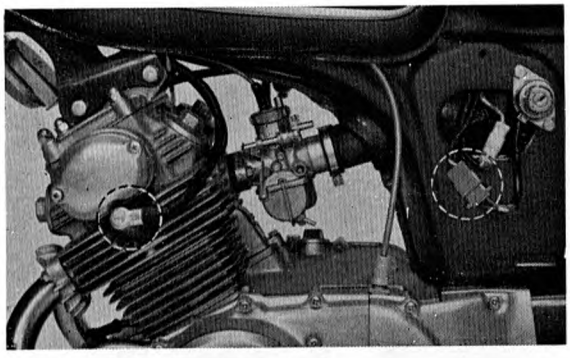
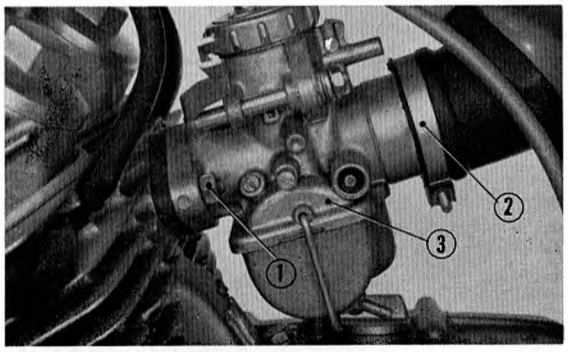


Fig. 3-2. Disconnecting leads

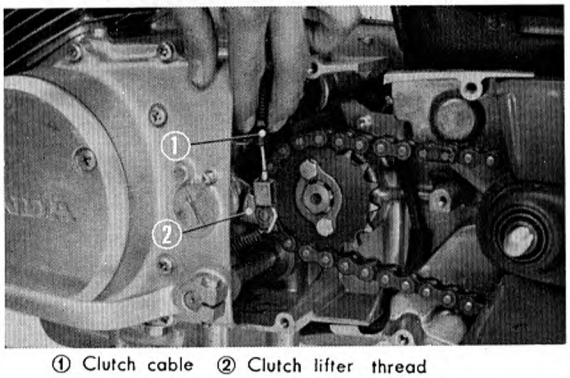
B. Removal

1. Shut off the fuel cock at the tank.
2. Remove the step ② by unscrewing the four 8×25 bolts ① mounting the step to the underside of the crankcase. **(Fig. 3-1)**
3. Disconnect the high tension terminals from the spark plug and all leads. **(Fig. 3-2)**
4. Unscrew the throttle cap, pull out the throttle and disconnect the throttle cable.

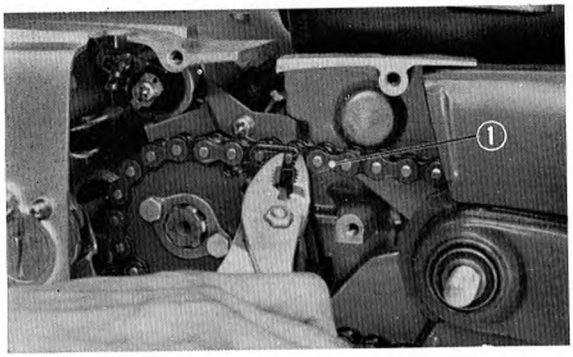
   Unscrew the two 6 mm nuts ① mounting the carburetor ③ to the cylinder head, loosen the air cleaner connecting tube band ② and remove the carburetor. **(Fig. 3-3)**
5. Unscrew the 6 mm screws, remove the left crankcase rear cover and disconnect the clutch cable lower end ① from the clutch lifter thread ②. **(Fig. 3-4)**



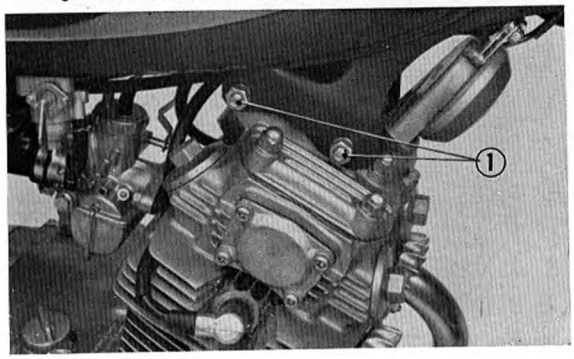
① Carburetor mounting nut
② Air cleaner connecting band ③ Carburetor
Fig. 3-3. Removing the carburetor



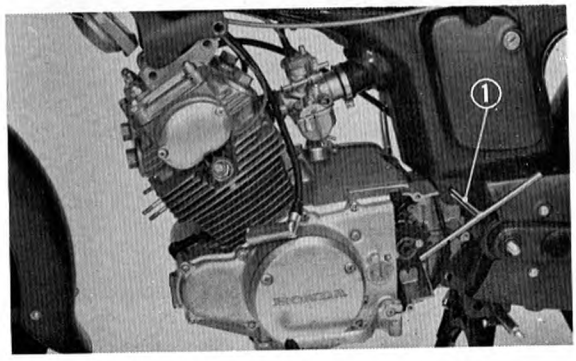
① Clutch cable ② Clutch lifter thread
Fig. 3-4. Disconnecting the clutch cable



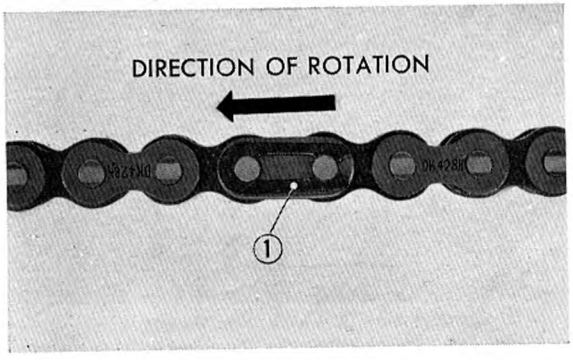
① Drive chain
Fig. 3–5. Disconnecting the drive chain



① Engine mounting nut
Fig. 3–6. Removing the engine



① T–handle cross screwdriver
Fig. 3–7. Installing the engine



① Joint clip
Fig. 3–8. Direction of the drive chain

6. Rotate the rear wheel to position the chain joint adjacent to the drive sprocket and disconnect the drive chain. **(Fig. 3–5)**

   When disconnecting the chain, attach a piece of wire to both ends of the chain to prevent the chain from coiling up in the chain case, thus facilitating the task of reinstalling the chain.
7. Remove the brake pedal spring and the stop light switch spring.
8. Remove the muffler mounting nuts, exhaust pipe joint and remove the mufflers.
9. Unscrew the four engine mounting nuts, place a support block under the engine to prevent dropping and then drive out the mounting bolts. The engine will be freed from the frame. **(Fig. 3–6)**

C. Installaton

1. Perform the engine installation in the reverse order of removal described in Section 3.1 B.
2. The engine installation can be made easier by temporarily hanging the engine on the frame by the use of the T-handle cross screwdriver followed by the installation of the engine mounting bolts. **(Fig. 3–7)**

(Note)

When reconnecting the drive chain the joint clip should be installed with the opening facing opposite to the direction of the normal drive chain movement. **(Fig. 3–8)**

3. Adjust the chain tension so that there will be 1 to 2 cm (0.40～0.80 in) slack at the chain.

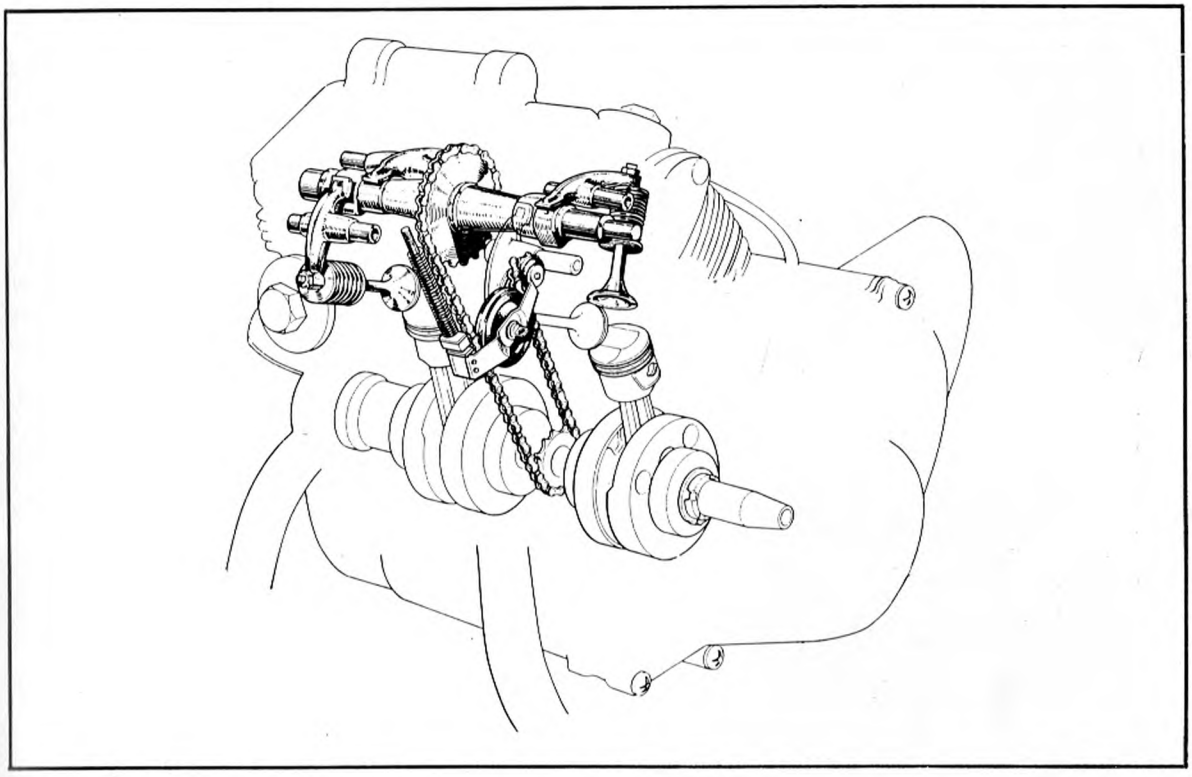


Fig. 3–9. .Valve mechanism

3.2 CYLINDER HEAD AND CYLINDER

1. CYLINDER HEAD

A. Construction

The cylinder head is a cast aluminium twin construction of a semi-spherical combustion chamber with a squish area for better combustion efficiency. The single piece overhead camshaft, rocker arm and valve mechanism are all incorporated in the valve chamber above the combustion chamber. **(Fig. 3–9, 3–10)**

Breaker assembly is mounted on the left end of the camshaft.

Cylinder head cover incorporates a breather passage to prevent the pressure build up.

B. Disassembly

1. Drain oil from the engine.
2. Remove the kick starter pedal, right crankcase cover, cylinder head side cover.
3. Remove the clutch pedal, left crankcase cover, point cover and breaker assembly.
4. Remove the eight 8 mm blind nuts ① and 6×45 hex. bolt ② and then remove the cylinder head cover ③. **(Fig. 3–11)**
5. Rotate the crankshaft so that the cam chain joint clip ② is toward the top of the cam sprocket and then disconnect the cam chain ①. **(Fig. 3–12)**
   Attach a wire to both ends of the chain before disconnecting, this will simplify the assembly task later.
6. Separate the cylinder head.

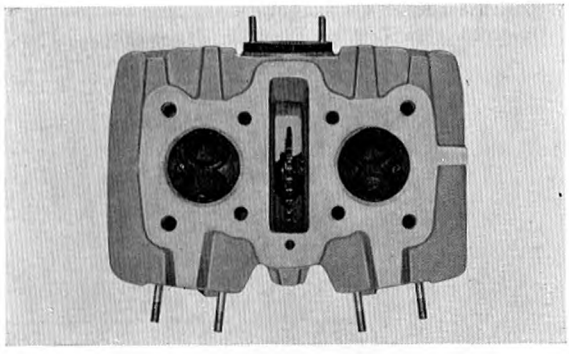
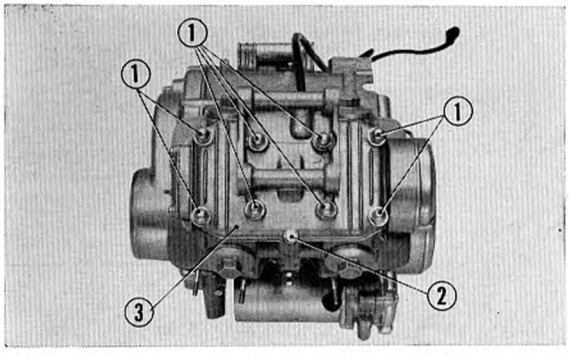
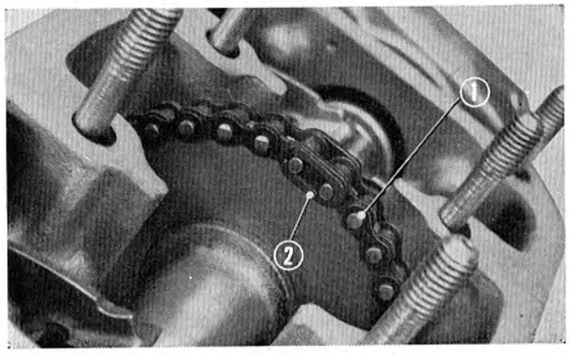


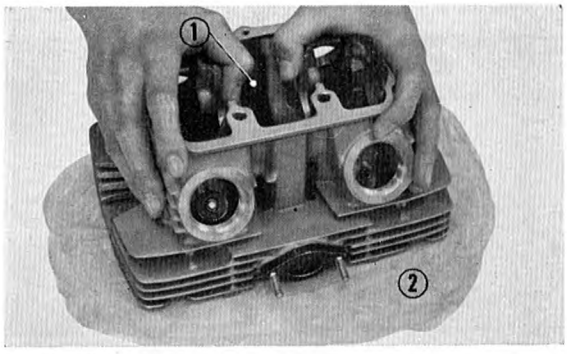
Fig. 3–10. Cylinder head combustion chamber



① 8 mm bind nut ② 6×45 hex bolt
③ Cylinder head cover
Fig. 3–11. Removing the cylinder head cover



① Cam chain ② Joint clip
Fig. 3-12. Disconnecting the cam chain



① Cylinder head ② Bluing or red lead
Fig. 3-13. Checking the cylinder head for warpage

C. Inspection

1. The cylinder head is exposed to the high pressure and temperature resulting from the combustion of the fuel mixture, further, when the head is unevenlly torqued, it may develop cracks or warpage and will cause defective sealing between the head and the cylinder resulting in gas leak, air sucking with consequent drop in compression.

   The warpage of the cylinder head does not develop suddenly and it may be overlooked, therefore, caution should be exercised during reassembly since the uneven torquing of the cylinder head is a very common fault.

   To inspect for warpage of the cylinder head, apply a thin coat of bluing or red lead on a surface plate and work the mating surface of the cylinder head on the surface plate ; the warpage can be determined by the transfer of the bluing on to the cylinder head. **(Fig. 3-13)**

   To correct the warpage, lap the cylinder head on the surface plate with a #200 sandpaper, finally finish by using a #400 sandpaper, and then inspect again with the bluing.
2. Inspect the combustion chamber, inlet and exhaust ports for cracks.
3. Cylinder head combustion chamber.

Item	Standard Value
Height	18.5 mm (0.728 in)

4. Inspect the valve guide and valve stem. Check the valve guide diameter at the top, center and bottom in both the X and Y axis, using a precision cylinder gauge. Check the valve stem with micrometer.

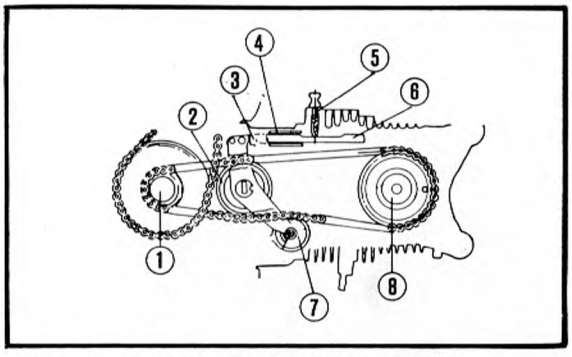
   If the valve guide inside diameter is beyond serviceable limit, it may be repaired by using a reamer (Tool No. 07008-00101) and replacing the valve with one of an oversize.

	Item	Standard Value	Serviceable Limit
Inlet valve	Outside diameter	5.48~5.49 mm (0.2158~0.2162 in)	Replace if under 5.46 mm (0.215 in)
	Contact face runout	with in 0.02 mm (0.0008 in)	
Inlet valve guide	Inside diameter •	5.5~5.515 mm (0.2165~0.2171 in)	Replace if over 5.555 mm (0.219 in)
	Outside diameter •	10.055~10.065 mm (0.3959~0.3963 in)	
	Interference fit •	0.04~0.065 mm (0.0016~0.0026 in)	
	Inlet valve clearance	0.01~0.035 mm (0.0004~0.0014 in)	Replace if over 0.08 mm (0.028 in)
Exhaust valve	Outside diameter	5.46~5.47 mm (0.2150~0.2154 in)	Replace if under 5.44 mm (0.214 in)
	Contact face runout	with in 0.02 mm (0.0008 in)	
Exhaust valve guide	Inside diameter •	5.5~5.515 mm (0.2165~0.2171 in)	Replace if over 5.555 mm (0.219 in)
	Outside diameter •	10.055~10.065 mm (0.3959~0.3963 in)	
	Interference fit •	0.04~0.065 mm (0.0016~0.0026 in)	
	Exhaust valve clearance	0.03~0.055 mm (0.0012~0.0022 in)	Replace if over 0.1 mm (0.0039 in)

5. When replacement of the valve guide becomes necessary, remove and replace with an oversize guide, use the valve guide remover (Tool No. 07047-04001) and the valve guide driver (Tool No. 07046-21601) for replacement operation. After installing the valve guide, use a reamer to obtain the proper valve clearance.

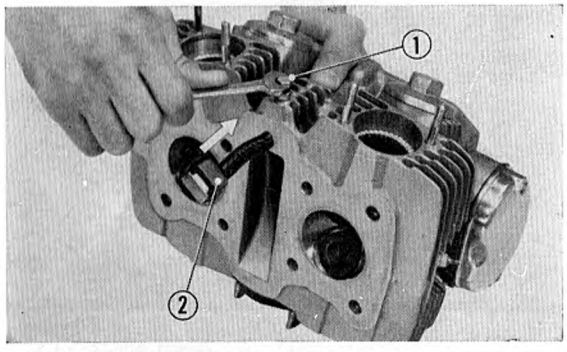
D. Reassembly

1. Clean and inspect the cylinder head interior and exterior for cracks, damage and warpage, also inspect the head gasket, valves, valve guide and spring for satisfactory condition. Perform the head assembly in the reverse order of disassembly.
2. When installing the cylinder head to the cylinder, the cam chain should be assembled as shown in **Fig. 3-14** and attention should be given to the proper valve timing. The joint clip must be installed with the opening facing in the opposite direction to the normal chain movement.



① Center crankshaft ② Cam chain guide roller
③ Tensioner push rubber ④ Cam chain tensioner spring
⑤ Tensioner set bolt ⑥ Tensioner push bar
⑦ Cam chain tensioner ⑧ Cam shaft
Fg. 3-14. Assembling the cam chain

3. If the cam chain tensioner pushbar is not completely pushed in, the cam chain cannot be connected. **(Fig. 3-15)**



① Tensioner set bolt ② Tensioner push bar
Fig. 3-15. Pushing in the tension push bar

4. The cylinder head should be tightened uniformly with the torque wrench in the sequence shown in **Fig. 3-16.** [Torque : 160~210 Kg. cm (11.6~15.2 ft. lb)]

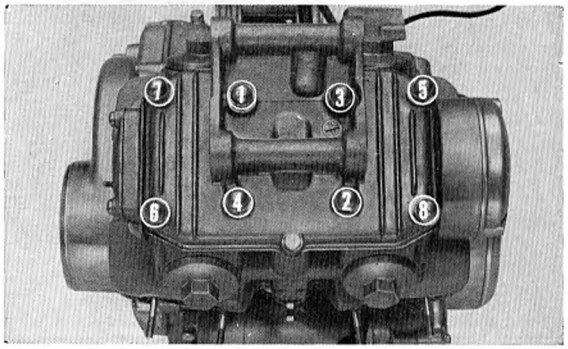


Fig. 3-16. Tightening sequence of the cylinder head

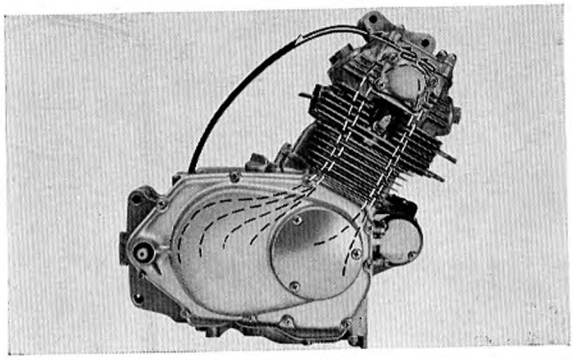
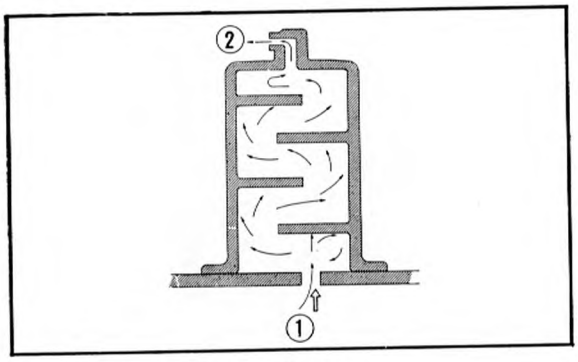
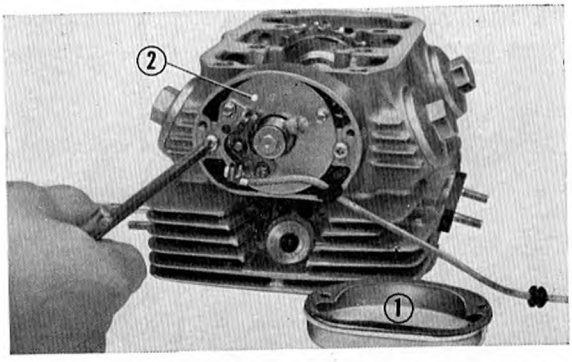


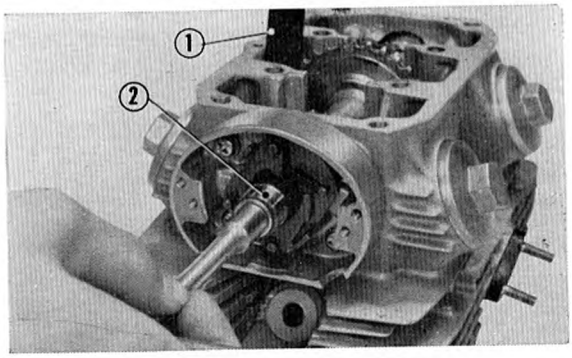
Fig. 3-17. Breather chamber



① From crankcase ② Exhaust gas
Fig. 3-18. Principle of breather



① Contact breaker cover ② Contact breaker assembly
Fig. 3-19. Removing the contact breaker assembly



① Wooden block stopper ② Spark advancer
Fig. 3-20. Removing the spark advancer

2. CYLINDER HEAD COVER AND BREATHER

A. Description

A breather chamber is incorporated in the head cover which provide constant pressure within the crankcase. Further, the oil is separated from the gas which is exhaust.

As the oil laden oil vapor passes through the breather passage, the oil is separated from the gas by centrifugal force and flows down the oil passage where it is collected. **(Fig. 3-17, 3-18)**

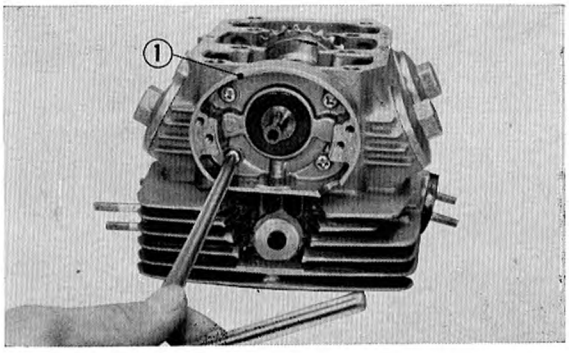
B. Disassembly of the spark advancer

1. Remove the contact breaker cover ①, contact breaker assembly ② and then remove the spark advancer from the camshaft. **(Fig. 3-19)**

(Note)

A wooden stopper block ① should be used to key the camshaft ② from turning. **(Fig. 3-20)**

2. The contact breaker point base can be removed by loosening the four mounting screws. **(Fig. 3–21)**
3. The spark advancer center piece serves as a bushing for the camshaft. It is oiled by the oil vapor and does not require special lubrication.
4. Perform the assembly is the reverse order of disassembly.
5. The cutout on the contact breaker point base should be aligned so that it is at the top.



① Contact breaker point base
Fig. 3–21. Removing the contact breaker point base

3. CAMSHAFT

A. Construction

A single piece camshaft contains both inlet and exhaust cams together with the sprocket which is mounted in the center of the crankshaft.

The cam sprocket is driven by the crankshaft at ½ the speed of the crankshaft. **(Fig. 3–22)**

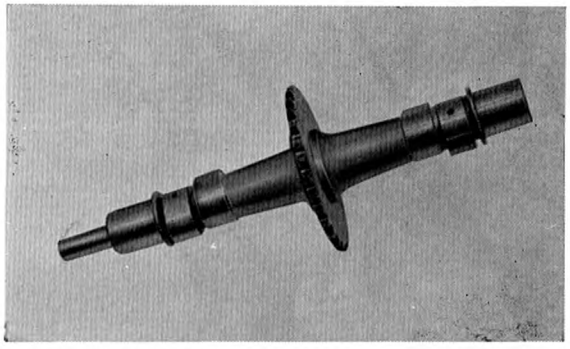
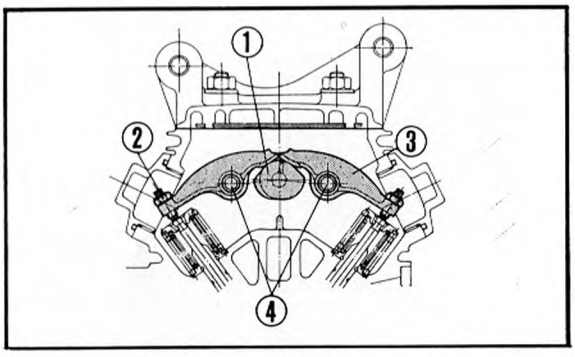
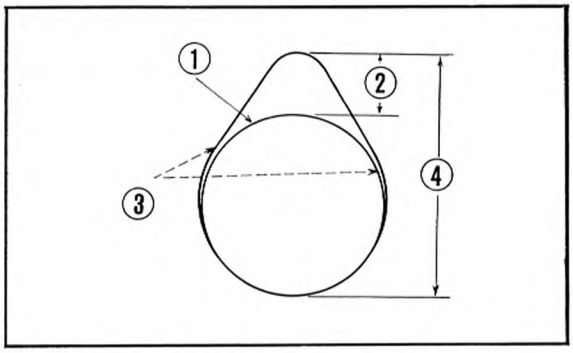


Fig. 3–22A. Camshaft

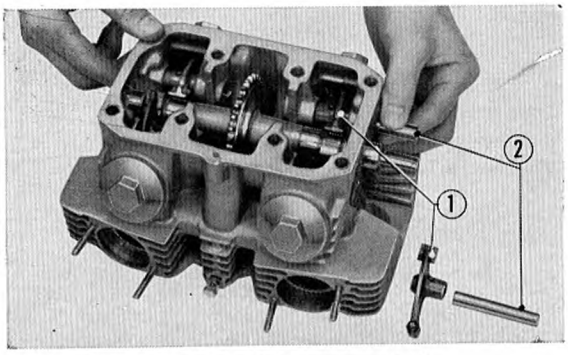


① Camshaft ② Tappet adjusting nut ③ Rocker arm
④ Rocker arm shaft
Fig. 3–22B.

The cam is provided with a long gradual rise to prevent abrupt rise and drop of the valve, thus assuring a quieter valve operation. **(Fig. 3–23)**



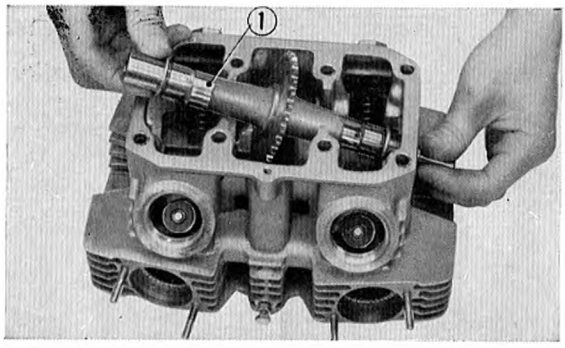
① Base circle ② Max cam lift ③ Buffer curve
④ Cam height
Fig. 3–23. Cam contour



① Valve rocker arm ② Rocker arm shaft
Fig. 3–24. Removing the rocker arm

B. Disassembly

1. Remove the cylinder head in accordance with Section 3.2.1. B.
2. Remove the left and right cylinder head side covers, contact breaker assembly, spark advancer and tappet adjusting hole cap. Rotate the camshaft so that both rocker arms are resting on the heel of the cam, in this position, disassemble the rocker arms from the head by removing the rocker arm shafts. **(Fig. 3–24)**



① Camshaft
Fig. 3–25. Removing the camshaft

3. Remove the camshaft from the cylinder head. **(Fig. 3–25)**

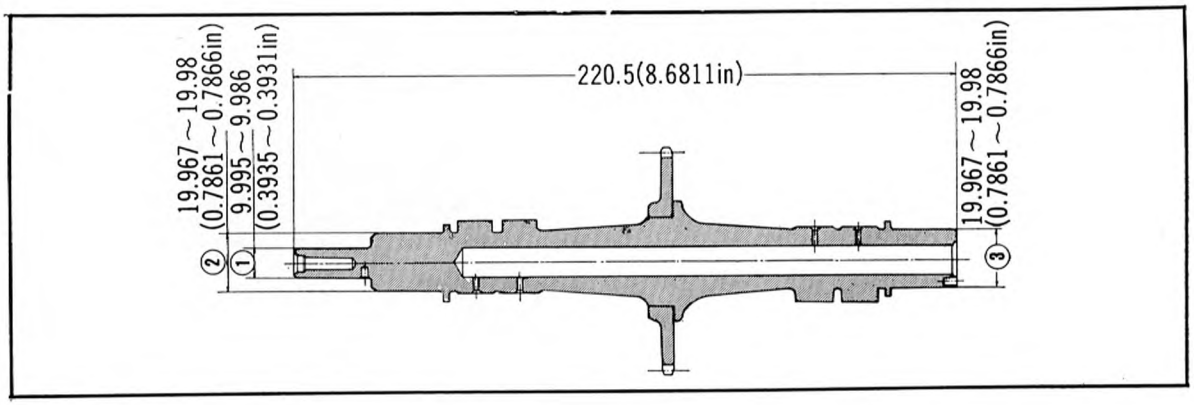


Fig. 3–26. Camshaft

C. Inspection

1. Camshaft **(Fig. 3–26)**

Item		Standard Value	Serviceable Limit
Right end diameter ③		19.967～19.98 mm (0.7861～0.7866 in)	Replace if under 19.947 mm (0.7853 in)
Left side diameter ②		19.967～19.98 mm (0.7861～0.7866 in)	Replace if under 19.947 mm (0.7853 in)
Cam base circle		21.0 mm (0.827 in)	
Cam height	IN	3.932 mm (0.1548 in)	
	EX	3.871 mm (0.1524 in)	

D. Reassembly

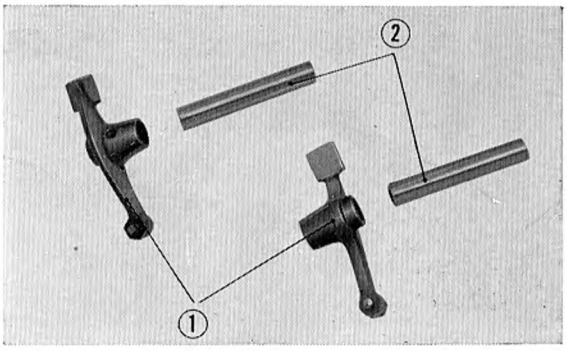
1. Screw out the tappet adjusting screw and assemble the rocker arm into the cylinder head in the reverse order of disassembly.
2. Adjust the tappet clearance to 0.05 mm (0.0020 in) with a cold engine.

(Note) Repair or replace the camshaft if the cam is scored or worn exessively.

4. ROCKER ARM

A. Construction

The function of the rocker arm is to transpose the rotary motion of the camshaft to a reciprocating motion for actuating the valve. The rocker arm is made rigid to prevent deflection and the end which contacts the cam is finished smooth after surface hardened to minimize wear. The end which operates the valve is provided with a tappet adjusting screw that contacts the valve. **(Fig. 3-27)**



① Valve rocker arm ② Rocker arm shaft
Fig. 3-27. Rocker arm shaft

B. Disassembly

1. Disassemble the rocker arm in accordance with Section 3.2.3. B.

C. Inspection

1. Rocker arm

Item	Standard Value	Serviceable Limit
Slipper surface wear	——	Replace if over 0.3mm (0.012 in)
Shaft bore dia	10.0~10.015 mm (0.3937~0.3943 in)	Replace if over 10.1 mm (0.40 in)

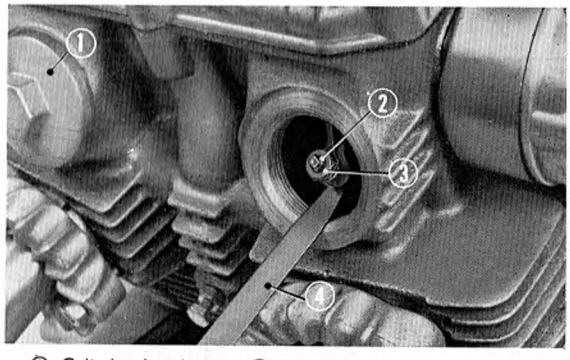
2. Rocker arm shaft

Item	Standard Value	Serviceable Limit
Outside dia	9.972~9.987 mm (0.3926~0.3933 in)	Replace if under 9.92 mm (0.3934 in)
Clearance	0.013~0.043 mm (0.0005~0.0017 in)	Replace if over 0.08 mm (0.0031 in)

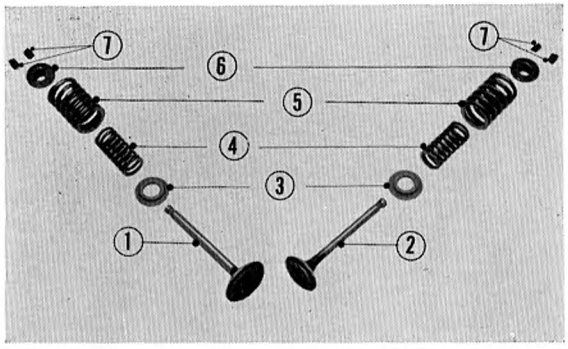
3. Check for proper tappet clearance, (both inlet and exhaust) should be 0.05 mm (0.002 in), too small a clearance will cause the valves to remain partly open, causing compression leak and results in hard starting.
4. Check for proper valve timing..
5. Check to see that the cam chain is not stretched.

D. Reassembly

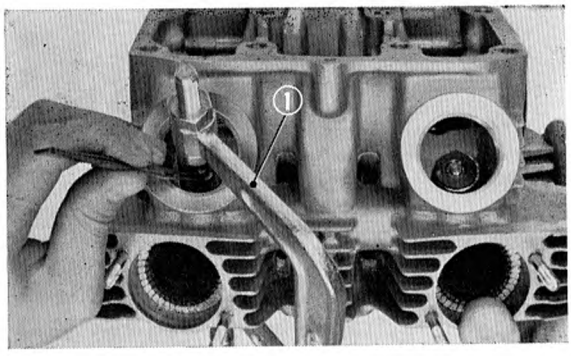
1. Inspect the rocker arm contact surface and repair or replace if there is scoring or excessive wear.
2. If the rocker arm had been disassembled, the tappet clearance should be readjusted. Make the adjustment by positioning the piston on top-dead-center of the compression 'stroke, this will free all of the valves. Align the "T" timing mark on the generator rotor to the timing index arrow mark on the stator..
3. Check the valve tappet clearance with the thickness gauge. **(Fig. 3-28)**



① Cylinder head cap ② Adjusting screw
③ Lock nut ④ Thickness gauge
Fig. 3-28. Checking the valve tappet clearance



① Inlet valve ② Exhaust valve ③ Valve spring seat
④ Inner valve spring ⑤ Outer valve spring
⑥ Valve spring retainer ⑦ Valve cotter
Fig. 3–29. Valves



① Valve lifter
Fig. 3–30. Removing the valve

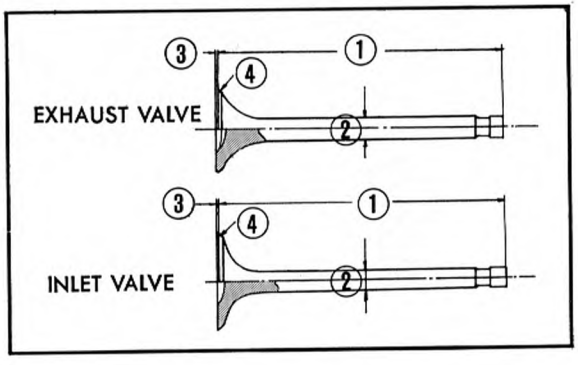


Fig. 3–31. Inlet and exhast valves

5. VALVE

A. Description

The valves control the volume of inlet air and also the exhaust gas entering and leaving the cylinder.

The diameter of the exhaust valve head is made smaller for better heat radiation. Inlet valve is made large for greater volumetric efficiency.

Double spring feature prevents the valves from floating during high speed operation. **(Fig. 3–29)**

B. Disassembly

1. Remove the cylinder head in accordance with Section 3.2 1 B.
2. Disassemble the rocker arm from the cylinder head by pulling out the rocker arm shaft.
3. Compress the valve spring with the valve lifter ① (Tool No. 07031–21601) and after removing the valve cotter, valve spring and the retainer, the valve can be removed. **(Fig. 3–30)**

C. Inspection

1. Exhaust valve **(Fig. 3–31)**

Item	Standard Value	Serviceable Limit
Length ①	72.15~72.45 mm (2.8405~2.8524 in)	Replace if under 71.75 mm (2.8248 in)
Stem dia ②	5.46~5.47 mm (0.2150~0.2154 in)	Replace if under 5.44 mm (0.2142 in)
Head thickness ③	0.55~0.85 mm (0.0217~0.0335 in)	Replace if under 0.3 mm (0.0118 in)
Concentricity of valve face ④	Within 0.03 mm (0.0012 in)	

2. Inlet valve

Item	Standard Value	Serviceable Limit
Length	73.35~73.65 mm (2.8878~2.8996 in)	Replace if under 72.95 mm (2.8720 in)
Stem dia	5.48~5.49 mm (0.2158~0.2162 in)	Replace if under 5.46 mm (0.125 in)
Head thickness	0.35~0.65 mm (0.0138~0.0256 in)	Replace if under 0.2 mm (0.0083 in)
Concentricity of valve face	Within 0.03 mm (0.0012 in)	

3. Valve spring measurement

Outer valve spring

Item	Standard Value	Serviceable Limit
Free length	31.8 mm (1.2520 in)	Replace if under 30.6 mm (1.2047 in)
Spring pressure	29.5 mm/7.5~8.3kg 1.1614 in/16.538~18.302 lbs)	——
	23.3mm/29.4~32.6kg (0.9173 in/64.827~71.883 lbs)	——

Inner valve spring

Item	Standard Value	Serviceable Limit
Free length	30.2 mm (1.1890 in)	Replace if under 29.7 mm (1.1693 in)
Spring pressure	26.2mm/4.08~4.52kg (1.0315 in/8.996~9.967 lbs)	——
	20.3mm/10.9~12.1kg (0.7992 in/24.035~26.681 lbs)	——

D. Reassembly

1. Before the valve is assembled, the valve contact surface should be inspected for wear, pitting, or carbon. After cleaning, oil the valve stem, and the valve should be inserted from the combustion chamber side.
2. The valve spring outer and inner retainers should be fitted from the cap hole of the tappet adjusting hole and compressed by using the valve lifter (Tool No. 07031–21601). Secure with the valve cotters.

6. VALVE SEAT

A. Description

The valve seat is repaired with three types of cutter; 60°, 45° and 30° cutters.

The relative location and the width of the valve seat contact area is accomplished with the 60° and 30° cutters while the refacing of the valve contact area is performed by the 45° cutter. **(Fig. 3–32)**

Valve seat cutters

Description	Tool No.
Valve seat cutter 90°	07001–23501
Flat surface seat cutter (IN)	07003–23501
Flat surface seat cutter (EX)	07004–23501
Interior seat cutter (IN)	07005–23501
Interior seat cuttor (EX)	07006–23501

Valve lapping operation is performed last, this is to obtain a leak proof seal between the valve and the valve seat. Place a liberal amount of lapping compound on the valve face and lap the valves., applying a slight pressure while rotating the valve back and forth with a suction cup lapping tool. Wash off the compound thoroughly and inspect the valve seat with bluing. **(Fig. 3–33)**

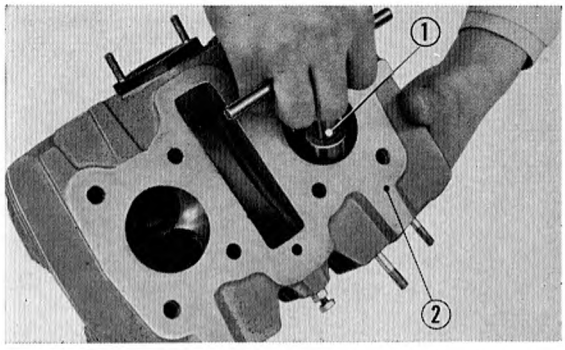
(Note)

(a) When the valve stem is greatly worn, the valve guide is usually also worn. Hence, when a valve is replaced, it also is desirable to replace the valve guide. Since the guide is press fitted, it is recommended that they be replaced with an over-size guide.

(b) When the valve is assembled, the compound which was used during lapping should be completely removed.

B. Inspection

1. A valve seat in good condition should have a full surface contact with the valve face.
   Standard value : 1.0 mm (0.04 in)
   Serviceable limit : in excess of 2 mm (0.08 in)
2. Assemble the valve into the cylinder head so that the valves are well seated, and fill the cylinder head combustion chamber with oil, inject a blast of air in from the inlet and exhaust ports and if any bubbles should appear, it is an indication that the valve seats are not completely sealed.



① Valve seat cutter ② Cylinder head
Fig. 3–32. Reworking the valve seat

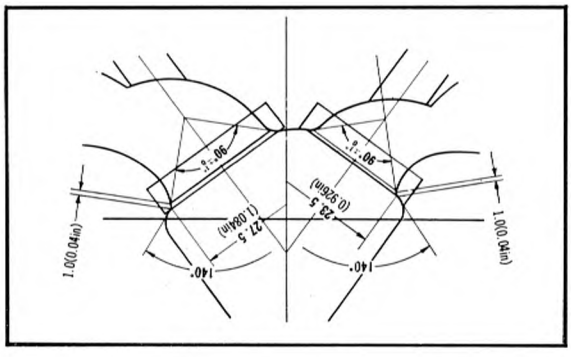


Fig. 3–33. Valve seat detail

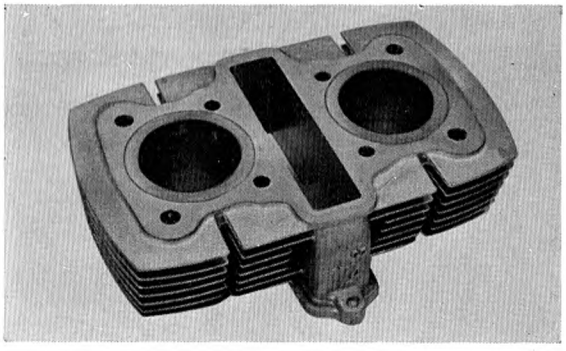
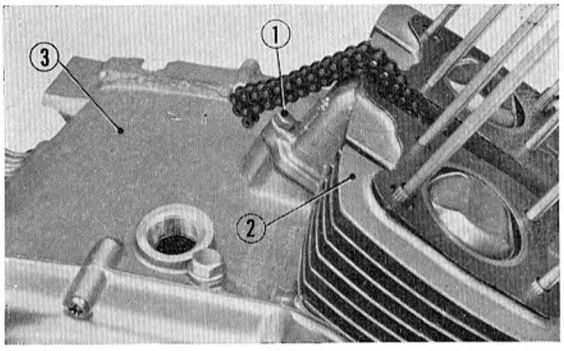
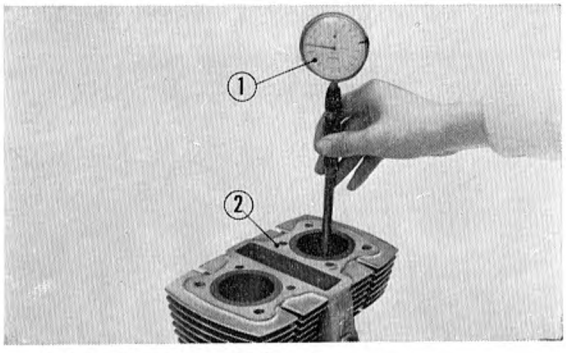


Fig. 3–34. Cylinder



① 6 mm hex bolt ② Cylinder ③ Upper crankcase
Fig. 3-35. Removing the cylinder



① Cylinder gauge ② Cylinder
Fig. 3-36. Measuring the cylinder bore

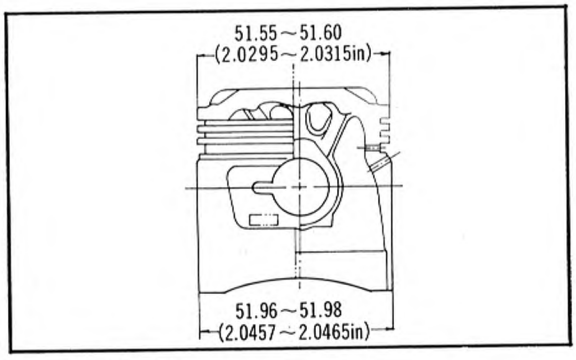
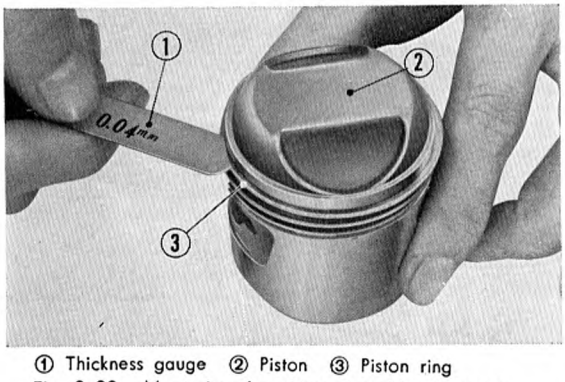


Fig. 3-37. Piston



① Thickness gauge ② Piston ③ Piston ring
Fig. 3-38. Measuring the piston ring side clearance

7. CYLINDER

A. Construction

The cylinder sleeve is made of special hard steel alloy and is press fitted into the lightweight cast aluminum body. A compartment is provided between the cylinder bores to accomodate the cam chain and tensioner. **(Fig. 3-34)**

(On the CD125, the chain compartment is on the left side).

B. Disassembly

1. Remove the cylinder head in accordance with Section 3.2.1. B.
2. Remove the 6 mm hex. bolt ① and then remove the cylinder ② from crankcase ③. **(Fig. 3-35)**

C. Inspection

1. Measure the cylinder bore, taper, out-of-round with a precision cylinder gauge.
   Take the measurement at the top, middle and bottom in both the X and Y axis. **(Fig. 3-36)**

Item	Standard Value	Serviceable Limit
Cylinder bore	52.00~52.01 mm (2.049~2.0494 in)	Repair if over 52.1 mm (2.0512 in)
Cylinder taper	0.005 mm (0.0002 in)	Repair if over 0.05 mm (0.0020 in)
Cylinder out of round	0.005 mm (0.0002 in)	Repair if over 0.05 mm (0.0020 in)

2. The clearance between the piston and cylinder will greatly affect the engine performance. Because the piston is elliptical, the clearance is controlled very closely. The clearance are not the same, however, if any area is greater than 0.1 mm (0.004 in), the cylinder should be rebored and fitted with an oversize piston.
   Oversize pistons are available in 0.25, 0.50, 0.75 and 1.00 mm (0.01, 0.02, 0.03 and 0.04 in) size.
3. When removing carbon deposits from the piston top and ring grooves, care should be exercised so as to not cause any scrafches or damages to the piston.
4. Measure the piston perpendicular to the piston pin hole. **(Fig. 3-37)**

Item		Standard Value	Serviceable Limit
Outside dia	Top	51.55~51.60 mm (2.030~2.031 in)	
	Skirt	51.96~51.98 mm (2.046~2.047 in)	

5. Measure the piston ring side clearance with a thickness gauge. **(Fig. 3-38)**

Item		Standard Value	Serviceable Limit
Piston ring side clearance	Top	0.025~0.055 mm (0.001~0.0022 in)	Replace if over 0.1 mm (0.004 in)
	Second	0.015~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 mm (0.004 in)
	Oil	0.01~0.045 mm (0.0004~0.0018 in)	Replace if over 0.1 mm (0.004 in)

6. Piston ring groove

Item		Standard Value	Serviceable Limit
Bottom dia		45.9~46.0 mm (1.707~1.811 in)	
Groove width	Top Second	1.205~1.220 mm (0.047~0.048 in)	Replace if over 1.3 mm (0.0512 in)
	Oil	2.50~2.52 mm (0.098~0.099 in)	Replace if over 2.6 mm (0.1024 in)

7. Piston rings

Measure the ring end gap by inserting the piston ring into the cylinder so that the ring is at right angle to the cylinder axis. **(Fig. 3-39)**

Item		Standard Value	Serviceable Limit
Ring thickness	Top	1.165~1.180 mm (0.046~0.0464 in)	Replace if under 1.125 mm (0.0443 in)
	Second	1.175~1.190 mm (0.046~0.047 in)	Replace if under 1.135 mm (0.0447 in)
	Oil	2.475~2.490 mm (0.097~0.098 in)	Replace if under 2.43 mm (0.095 7in)
Ring closing force	Top Second	0.52~0.78 kg (1.15~1.72 lbs)	Replace if under 0.42 kg (0.926 lbs)
	Oil	0.72~10.08 kg (1.59~2.22 lbs)	Replace if under 0.53 kg (1.169 lbs)
Ring end gap		0.15~0.40 mm (0.006~0.016 in)	Replace if over 0.8 mm (0.0315 in)

8. Check the gaskets for damage. Replace if any damage exists.

(Note)

1. Oversize piston rings are available in four sizes; 0.25, 0.50, 0.75 and 1.00 mm (0.01, 0.02, 0.03 and 0.04 in).
2. When making piston ring end gap measurement, insert the ring carefully into the cylinder to prevent scratches or gouges to the cylinder wall.

D. Reassembly

1. After assuring that there are no damages or excessive wear to the cylinder, assemble the cylinder in the reverse order of disassembly.
2. Make sure that the cylinder gasket and the two dowel pins are installed.
3. During the installation of the cylinder ①, use piston bases ② to prevent piston movement, also use a ring compressor ③ to prevent ring damages. **(Fig. 3-40)**
4. Assemble the cylinder head and cover unit.

(Note)

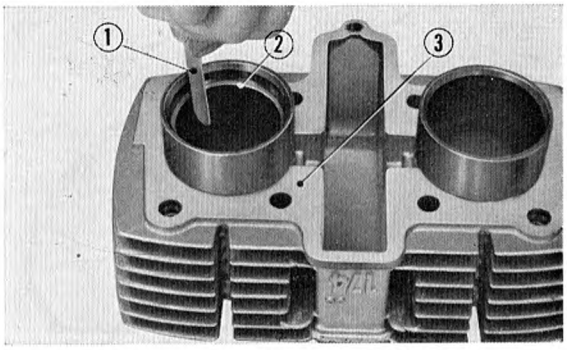
Check to make sure that the gaskets are properly in place.

3.3 LEFT CRANKCASE COVER

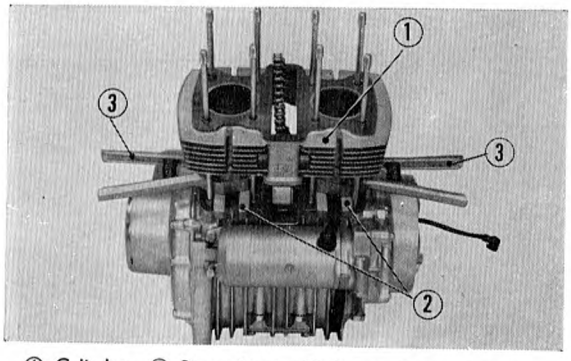
1. LEFT CRANKCASE COVER

A. Construction

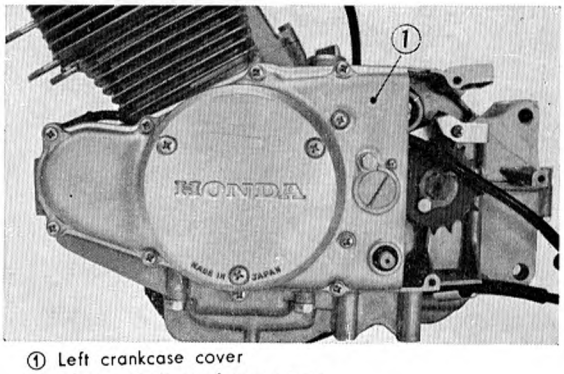
The purpose of the crankcase is to protect the vital components of the engine. The left crankcase houses the A.C generator stator. **(Fig. 3-41, 3-42)**



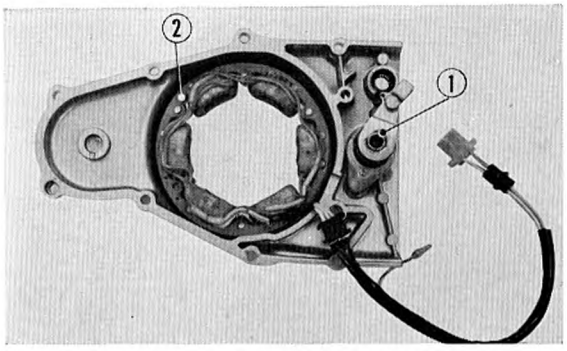
① Thickness gauge ② Piston ring ③ Cylinder
Fig. 3-39. Measuring the piston ring end gap



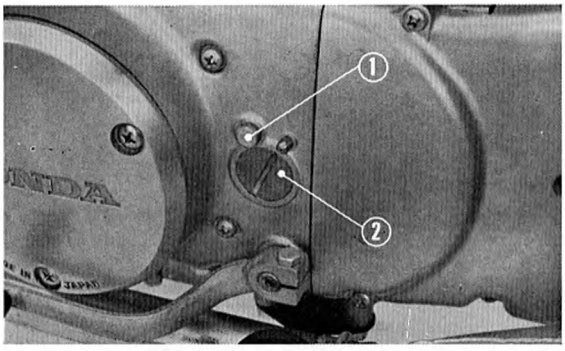
① Cylinder ② Piston base ③ Piston ring compressor
Fig. 3-40. Installing the cylinder



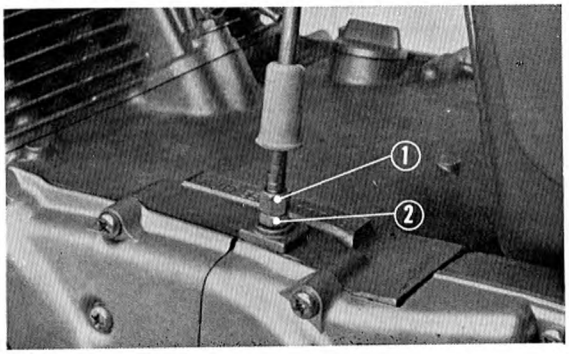
① Left crankcase cover
Fig. 3-41. Left crankcase cover



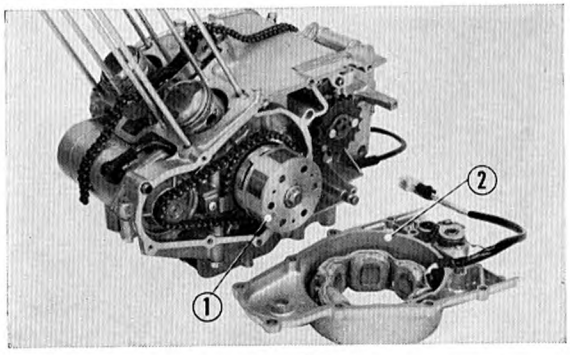
① Clutch lifter thread ② A.C. generator stator
Fig. 3–42. Stator housed in the left crankcase cover



① Clutch adjusting bolt ② Clutch adjuster
Fig. 3–43.



① Clutch cable lower adjuster ② Locking nut
Fig. 3–44



① A.C. generator rotor ② A.C. generator stator
Fig. 3–45. A.C. generator and rotor

B. Disassembly

1. Drain the oil from the crankcase.
2. Remove the gear change pedal.
3. After removing the mounting screws, the left crankcase cover can be separated from the crankcase.

C. Reassembly

1. Perform the assembly in the reverse order of disassembly. Make sure that the gaskets are not damaged or misaligned and that the clutch action is normal.
2. Perform clutch adjustment. **(Fig. 3–43, 3–44)**

2. A.C. GENERATOR

A. Construction

The detailed description of the A.C. generator is given in the Electrical Section.

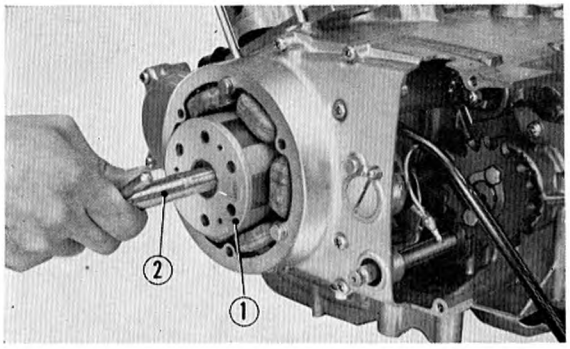
In order to provide a clean appearance, the A.C. generator is mounted in the left crankcase cover. **(Fig. 3–45)**

B. Disassembly

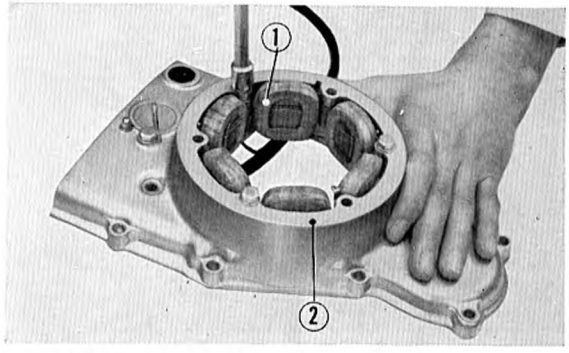
1. It is not necessary to remove the engine to disassemble the A.C. generator.

   (In this section, operation is explained with the engine dismounted.)

2. Unloosen the three screws and remove the dynamo cover.
3. Remove the rotor mounting bolt and remove the rotor ① with the use of the generator rotor puller ②. (Tool No. 07011-21601) **(Fig. 3-46)**
4. Unloosen the screws and remove the left crankcase cover and the stator ① from the left crankcase cover ②. **(Fig. 3-47)**



① A.C. generator rotor ② Roter puller
Fig. 3-46. Removing the A.C. generator rotor



① A.C generator stator ② L. Crankcase cover
Fig. 3-47. Removing the A.C. generator stator

C. Reassembly

1. Assemble the A.C. generator in the reverse order of removal.

   Setting torque : 160-210 kg-cm (11 6-15.2 ft lbs)

(Note)

Make sure that the key is installed during mounting of the rotor.

3. STARTING SPROCKET AND CLUTCH

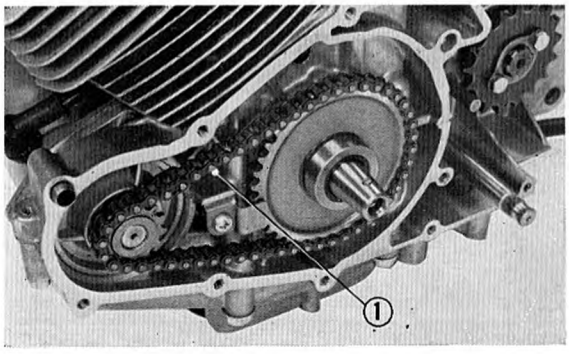
A. Construction

The starter armature speed is reduced by a series of gears enclosed within the starter housing. The chain further reduces the speed and provides high torque to turn over the crankshaft for each starting. To prevent the starter from being motorized after the engine starts, an overrunning clutch is incorporated into the A.C. generator rotor. Refer to the electrical section for details.

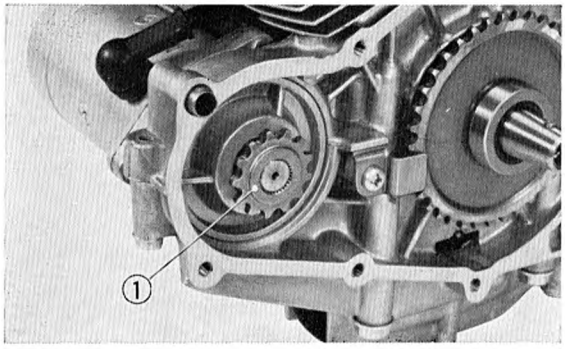
B. Disassembly and reassembly of the starting clutch

1. Remove the A.C. generator in accordance with section 3.3.2. B.
2. Remove three screws and remove the starting clutch.
3. Reassemble the starting clutch and A.C. generator in the reverse order of disassembly.

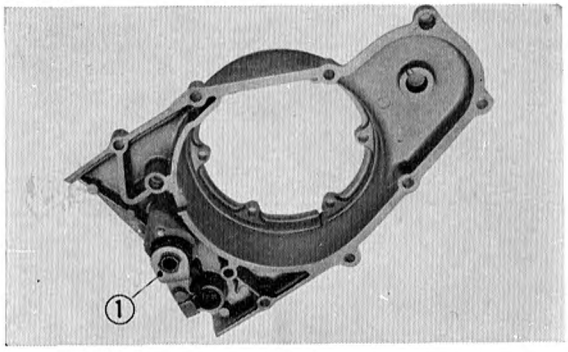
   Check to assure smoother roller operation.
   Check condition of side plate and guide.
   Check for the weak or broken clutch roller spring.



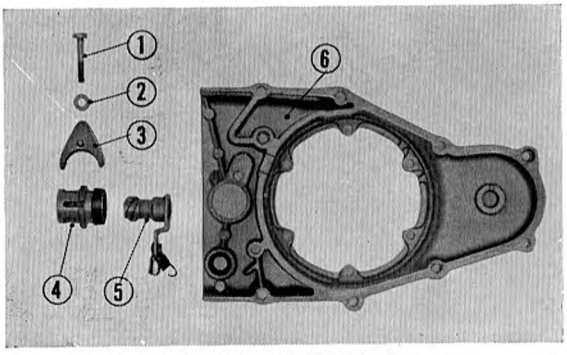
① Starting chain
Fig. 3-48. Removing the starting chain



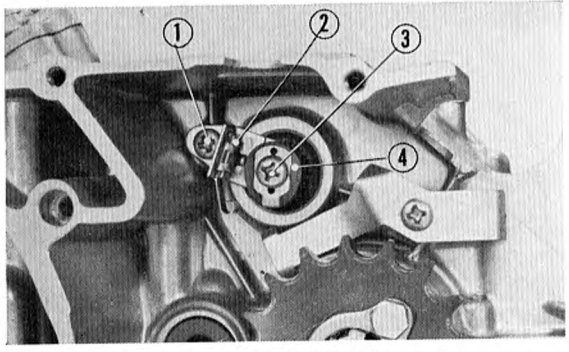
① Starting motor sprocket
Fig. 3-49. Starting motor sprocket



① Clutch lifter thread
Fig. 3-50. Clutch adjuster



① 6×36 hex bolt ② 6 mm flat washer
③ Adjuster fixing piece ④ Clutch adjuster
⑤ Clutch lifter thread ⑥ Left crankcase cover
Fig. 3-51. Components of clutch



① 6×12 cross screw ② Neutral switch stator
③ 6×20 cross screw ④ Neutral switch. rotor
Fig. 3-52. Removing the neutral switch rotor

C. Disassembly and reassembly of the starting sprocket

1. After the removal of the A.C. generator and starting clutch is completed, remove the starting chain ① by disconnecting at the joint clip. **(Fig. 3-48)**
2. Remove the starting sprocket set plate and remove the starting sproket.
3. Starting motor sprocket is easily removable from the serrated shaft. **(Fig. 3-49)**

(Note)

The starting chain joint clip must be installed with the open end opposite to normal direction of chain movement.

4. CLUTCH ADJUSTER AND NEUTRAL SWITCH ROTOR

A. Operation of clutch adjuster

The function of the clutch is to temporarily disengage the transmitting of the power between the engine and the transmission during the period of gear change. Clutch is operated by the handle lever through a cable to apply pressure which overrides the clutch springs. The clutch adjuster is set to provide the proper clutch action. **(Fig. 3-50, 3-51)**

B. Disassembly and reassembly of the clutch adjuster

1. Remove the crankcase cover in accordance with Section 3.3.1 B.
2. Remove the 6×36 bolts from the adjuster fixing plate and then remove the clutch lever spring to separate the clutch adjuster.
3. Apply grease to the clutch adjuster before assembly, use grease type HD multipurpose NLGI No. 2.

C. Disassembly and reassembly of the neutral switch rotor

1. Remove the left crankcase cover.
2. Loosen the 6×12 screw ① and remove the neutral switch stator ②. **(Fig. 3-52)**
3. Unscrew the 6×20 screw ③ and remove the neutral switch rotor ④ from the gear shift drum. **(Fig. 3-52)**
4. Fit the neutral switch rotor groove to the gear shift drum key and perform the assembly in the reverse order of disassembly.

3.4 RIGHT CRANKCASE COVER ASSEMBLY

1. RIGHT CRANKCASE COVER

A. Construction

The right crankcase cover ① and the left crankcase cover, house the engine primary components. The oil filter cover ② is fitted to the case cover and provides the passage for lubricating oil in both directions. **(Fig. 3–53)**

B. Disassembly

1. Remove the kick starter arm from the kick pinion shaft.
2. By removing the ten screws securing the case cover, the right crankcase cover can be removed. **(Fig. 3–54)**
3. After unscrewing the three 6×16 screws, the filter cover can be removed.

(Caution)

During operation, attention should be given to the two 74.5×3 "O" rings fitted to the filter cover to assure that there are no oil leaks.

C. Reassembly

1. Before performing the assembly, inspect the crankcase and oil filter covers for cracks and also for any damages to the mating surfaces since they will cause oil leaks.
2. Clean the O rings ① and inspect for any damages; replace if necessary. **(Fig. 3–55)**
3. After installation of the screws, tighten them uniformly to prevent the covers from warping and consequent oil leaks.

2. CLUTCH

A. Description and operation

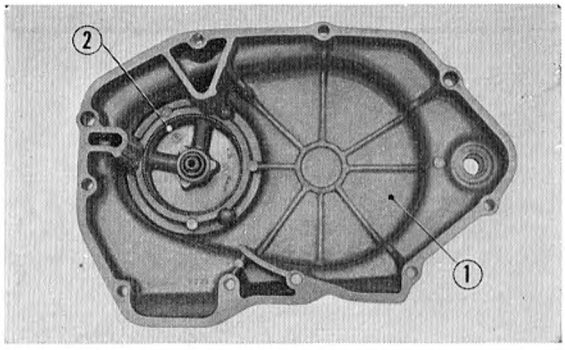
The function of the clutch is to temporariiy disengage the transmitting of the rotary motion between the engine and the transmission during the gear change and then after the gear change, permit a smooth power transition. The condition of the clutch will have a varying effect on the efficiency of the power transmission. **(Fig. 3–56)**

The clutch mechanism is of a conventional wet type multiple disc operated by the clutch lifter thread connected by a cable to the clutch lever.

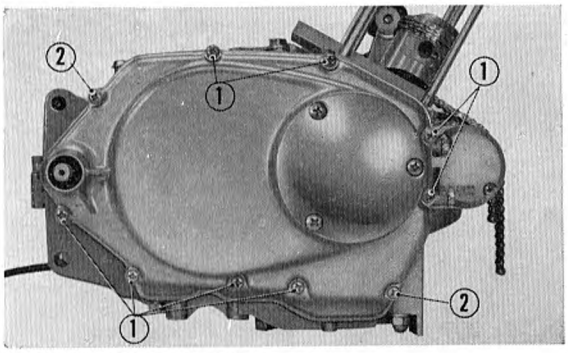
When the right crankcase cover is removed, the clutch complete is exposed. To the clutch outer complete, the clutch spring driving the clutch pressure plate is installed. The clutch plate is installed with the clutch friction disc between the clutch center with four 6×20 hex bolts.

The clutch plate has teeth cut on the inside. These teeth are engaged with teeth cut on the outside of the clutch center. The clutch center is coupled to the transmission main shaft by spline. Hence, it and the transmission main shaft are essentially a single unit. The clutch plate, clutch center, and clutch pressure plate rotate.

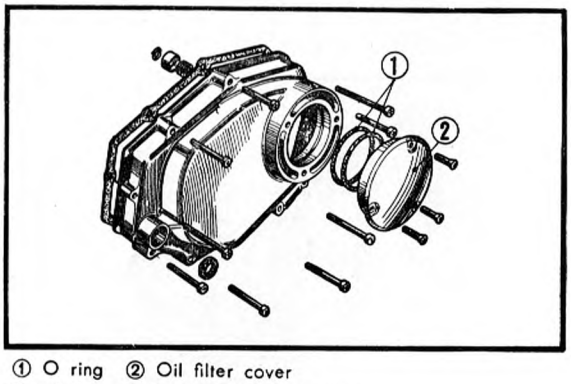
On the other hand, to the groove cut on the exterior circumference of the clutch outer, the clutch friction disc is coupled by the collar entering the groove; freewheeling rotation with the transmission main shaft is obtained. Hence, while the clutch is connected, the clutch outer center, six clutch plates, six clutch friction discs, and clutch pressure plate are essentially a single unit through friction exerted by



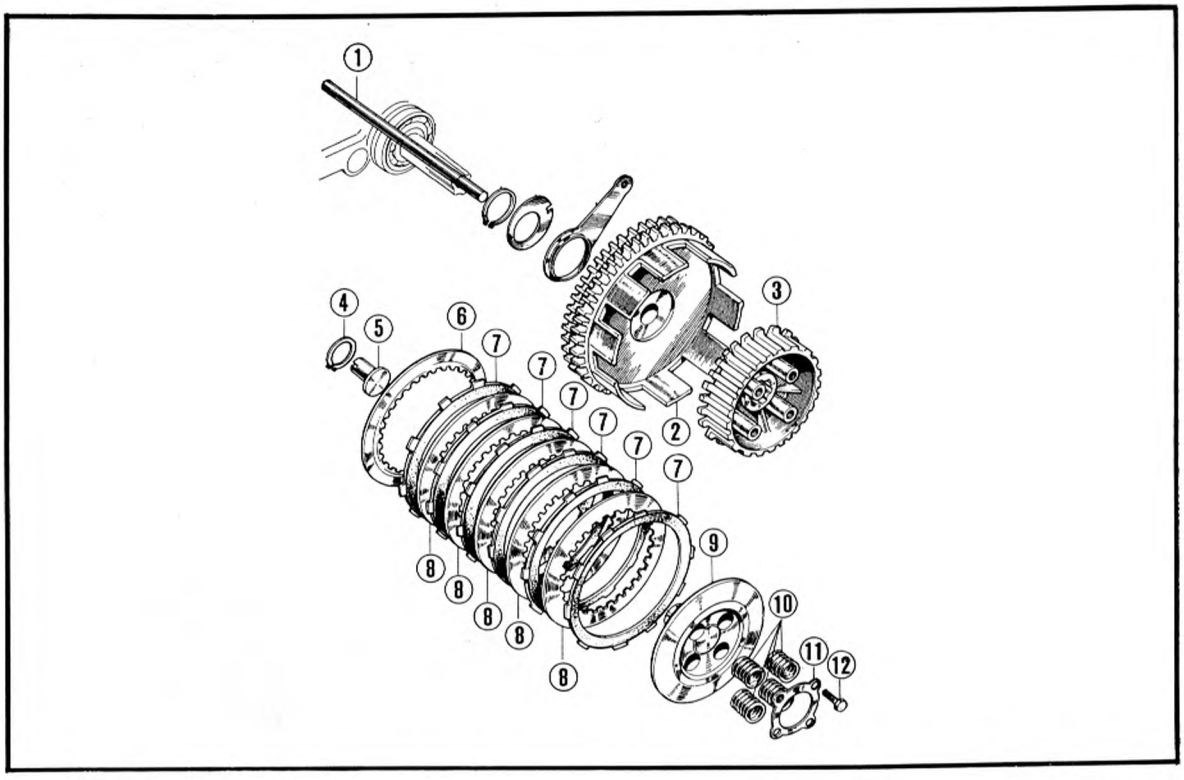
① Right crankcase cover ② Oil filter cover
Fig. 3–53. Right crankcase cover



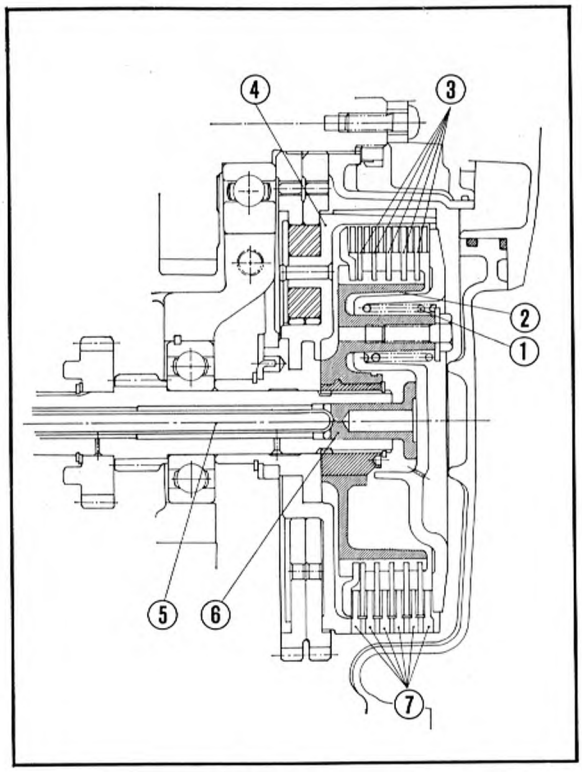
① 6×32 screws ② 6×45 screws
Fig. 3–54. Right crankcase cover screws



① O ring ② Oil filter cover
Fig. 3–55. O ring and oil filter cover



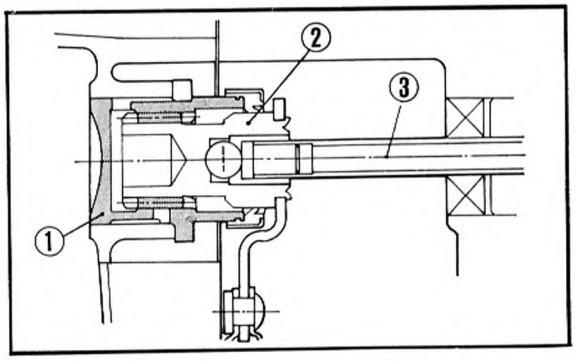
① Clutch rod ② Clutch outer complete ③ Clutch center ④ 20 mm set ring ⑤ Clutch lifter joint piece ⑥ Clutch plate B
⑦ Clutch friction disc ⑧ Clutch plate ⑨ Clutch pressure plate ⑩ Clutch spring ⑪ Clutch spring retaining plate
⑫ 6×20 hex bolt. **Fig. 3–56.** Clutch



① Clutch spring ② Clutch center ③ Clutch plate
④ Clutch outer ⑤ Clutch lifter rod
⑥ Clutch lifter joint piece ⑦ Clutch friction disc
Fig. 3–57. Sectional view of clutch

the clutch spring; rotation of the crankshaft is transmitted to transmission system.

When the clutch lever is gripped, the clutch adjuster rotates clockwise, the adjustment thread is pushed out by the square-headed thread in the clutch adjuster fitted to the left crankcase cover; this is pushed out by the clutch joint through the clutch rod. The clutch spring is compressed and the six clutch friction discs and six clutch plates become disengaged. Hence, the rotary motion of six clutch plates and six clutch discs is not transmitted to the clutch center. **(Fig. 3–57, 58)**



① Clutch adjuster ② Clutch lifter thread
③ Clutch lifter rod
Fig. 3–58. Sectional view of clutch adjusting thread

B. Disassembly

1. Remove the right crankcase cover.
2. Unscrew the four clutch pressure plate retainer bolts and remove the friction disc and clutch plates.

3. Remove the oil filter rotor lock nut and then the oil filter retaining lock nut to pull the rotor off the crankshaft.
4. Remove the 20 mm set ring ① and remove the clutch center ② **(Fig. 3–59)**
5. Unscrew the oil pump body mounting nuts and separate the oil pump from the crankcase.
6. Remove the oil pump assembly together with the clutch outer cover. **(Fig. 3–60)**

(Caution)

Pull off the clutch unit parallel to the shaft exercising care so that the shaft is not damaged.

C. Inspection

1. Clutch spring

Item	Standard Value	Serviceable Limit
Free length	31.05 mm (1.2224 in)	Replace if under 30.3 mm (1.1929 in)
Load	22.5mm/15.9~18.1kg (0.8858 in/ 35.060~39.911 lbs)	——

(Note)

Use coil spring tester (Tool No. 07134–99901) for testing the valve spring tension.

2. Friction disc

Item	Standard Value	Serviceable Limit
Thickness	2.92~3.08 mm (0.115~0.121 in)	Replace if under 2.5 mm (0.0984 in)
Warpage	Within 0.2 mm (0.0079 in)	Replace if over 0.5 mm (0.0196 in)

3. Clutch plate **(Fig. 3–61)**

Item	Standard Value	Serviceable Limit
Thickness	3.0 mm (0.118 in)	Replace if under 2.9 mm (0.114 in)
Warpage		Replace if over 0.5 mm (0.0196 in)

4. Primary drive gear

Item	Standard Value	Serviceable Limit
Chordel distance across 3 teeth	15.769~15.790 mm (0.6208~0.6185 in)	Replace if under 15.739 mm

D. Reassembly

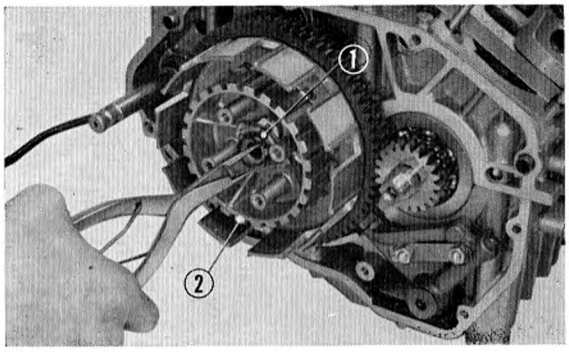
1. Reassemble the clutch in the reverse order of disassembly.

3.5 OIL PUMP, FILTER AND SEPARATOR

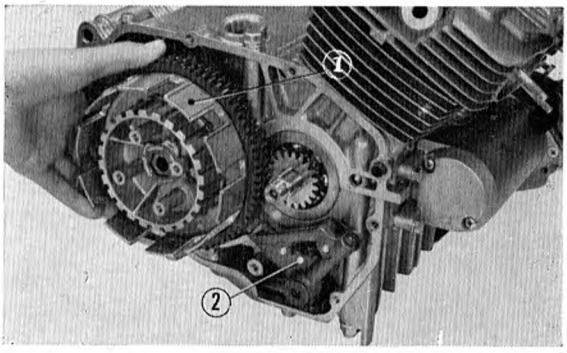
1. OIL PUMP

A. Description

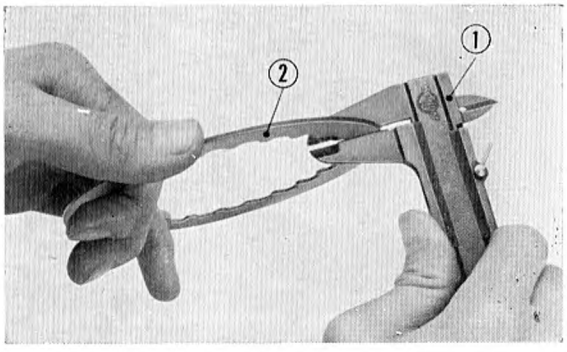
The oil pump is a plunger type, operated by a connecting rod through an eccentric cam on the transmission main shaft. **(Fig. 3–62)**



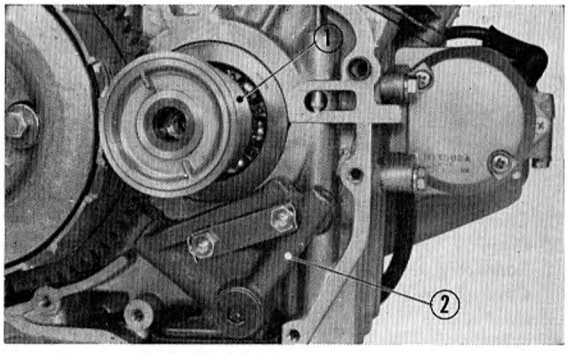
① 20 mm set ring ② Clutch center
Fig. 3–59. Removing the 20 mm set-ring



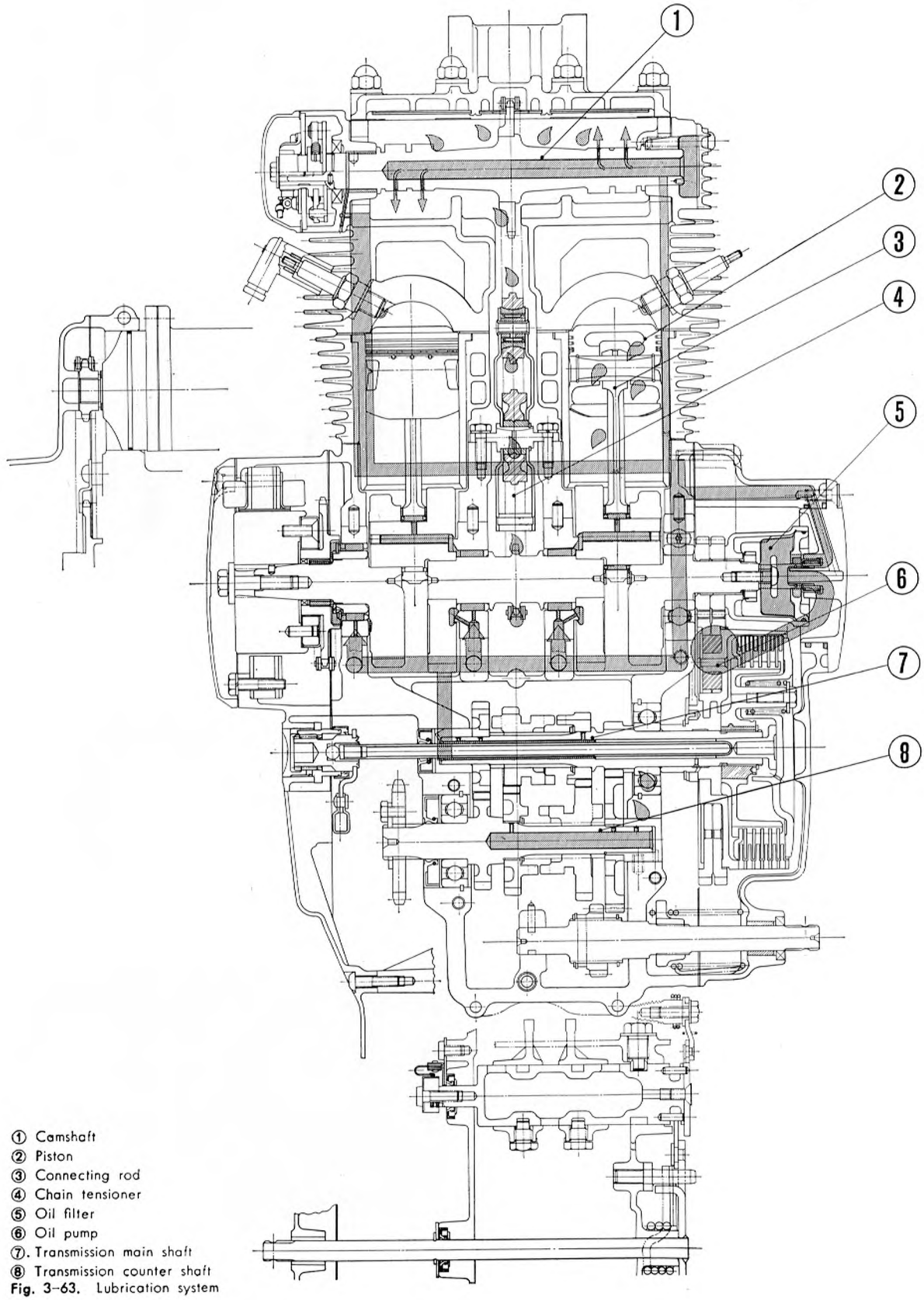
① Clutch outer ② Oil pump assembly
Fig. 3–60. Removing the clutch outer and pump body



① Vernier calipers ② Clutch plate
Fig. 3–61. Measuring the clutch plate thickness



① Oil filter rotor ② Oil pump
Fig. 3–62. Oil pump and centrifugal filter



① Camshaft
② Piston
③ Connecting rod
④ Chain tensioner
⑤ Oil filter
⑥ Oil pump
⑦. Transmission main shaft
⑧ Transmission counter shaft

Fig. 3-63. Lubrication system

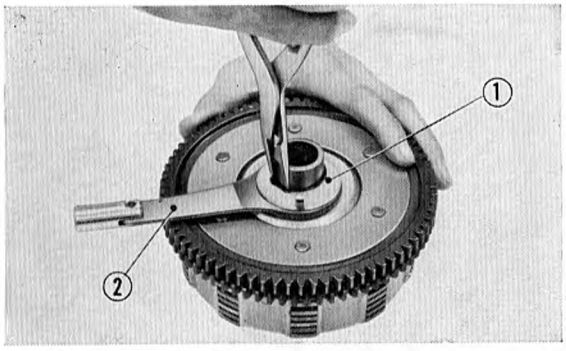
○ Lubrication system (Fig. 3–63)

The oil is picked up from the crankcase sump and routed through the oil passage to the oil filter where the impurities are removed by the centrifugally operating oil filter. The clean oil is then pressure fed through the upper crankcase to all the crankshaft bearing. The oil which enters the right and left crankcase outer rigs is separated into two routes, one is fed to the roller bearing and the other enters the crankshaft to lubricate the connecting rod large end through the holes drilled in the crankshaft journals. The connecting rod small end is lubricated by oil mist.

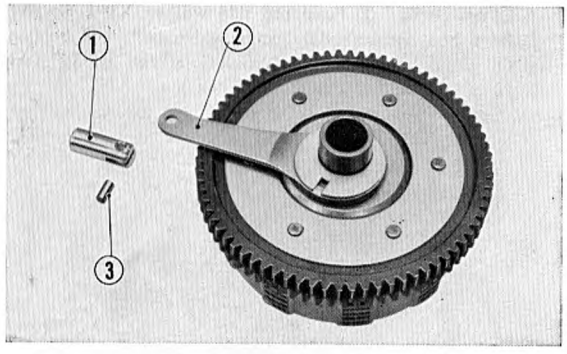
The oil from the upper crankcase oil passage is separated into two paths, one of the paths delivers oil to the top of the cylinder head through the cylinder stud bolts. This oil is fed into the camshaft from the rocker arm and lubricated. The oil lubricates the cam chain on its way down to the sump. The other oil path feeds the oil through the oil passage in the crankcase and enters the transmission to lubricate the free gears. The other gears and bearings are lubricated by oil droplets and mists.

B. Disassemble

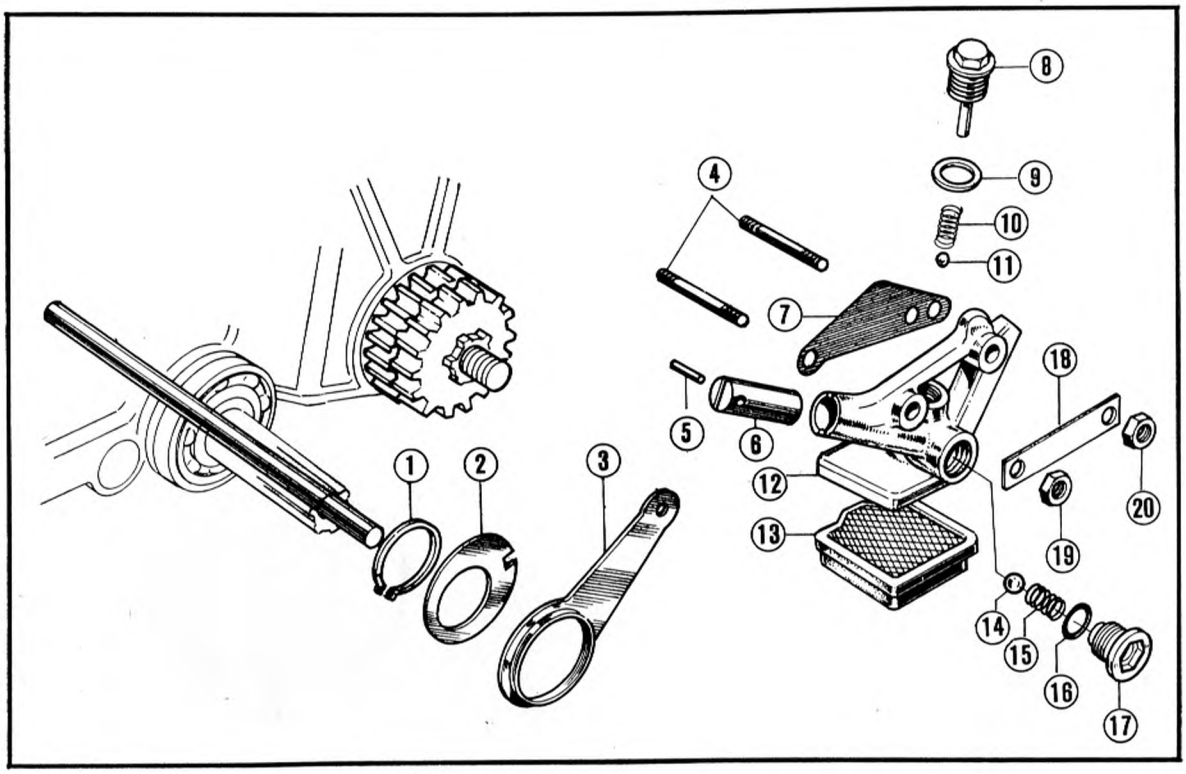
1. Remove the right crankcase.
2. Remove the oil filter.
3. Remove the right primary drive gear.
4. Separate the pump body together with the clutch.
5. By removing the 26 mm circlip, ① the pump rod ② can be separated from the clutch outer. **(Fig. 3–64)**
6. Extract the pump plunger pin ③ and remove the plunger ① at the tip of the pump rod. **(Fig. 3–65)**



① 26 mm circlip ② Pump rod
Fig. 3–64. Removing the pump rod



① Pump plunger ② Pump rod ③ Pump plunger pin
Fig. 3–65. Removing the plunger



① 26 mm circlip ② Pump rod side washer ③ Pump rod ④ 6×36 stud ⑤ Plunger pump pin ⑥ Plunger
⑦ Pump body gasket ⑧ Suction valve bolt ⑨ Suction valve bolt packing ⑩ Suction valve spring ⑪ 5/16″ steel ball
⑫ Oil pump filter screen ⑬ Pump filter screen ⑭ 5/16″ steel ball ⑮ Valve spring ⑯ 11.5×2 O ring ⑰ Outlet valve guide
⑱ Pump lock washer ⑲⑳ 6 mm hex nut.

Fig. 3–66. Pump component parts

7. Component parts of oil pump. **(Fig. 3–66)**

C. Inspection

1. The normal capacity of the oil pump is 3600cc/minute at 10,000 rpm; if the capacity falls below 3400 cc, there is a danger of developing engine seizure, therefore the pump should be repaired or replaced.
2. Clearance of component parts

Item	Standard Value	Serviceable Limit
Plunger to housing	0.025～0.063 mm (0.001～0.0025 in)	

D. Reassembly

1. Assemble the pump in the reverse order of disassembly.

(Note)

a. Proper operation of the oil pump can be checked by loosening the left rear cylinder head cap nut. If oil seeps out, the lubrication is normal.

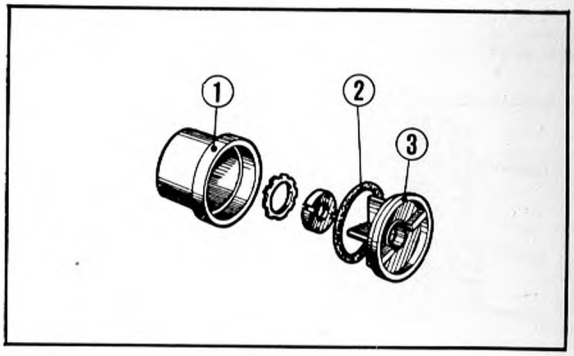
b. If there is absence of oil, check the following points:
   (a) Proper assembly of the pump.
   (b) Condition of gaskets.
   (c) Excessive clearance of punger.
   (d) Malfunction of the steel ball valve.
   (e) Clogged screw.
   (f) Clogged filter or oil passages.

2. OIL FILTER

A. Description

The engine oil is doubly filtered through the centrifugal filter and the mesh screen filter to assure clean supply of oil to the engine. **(Fig. 3-67)**

The screen filter is on the pump inlet side and the centrifugal filter is on the outlet side.

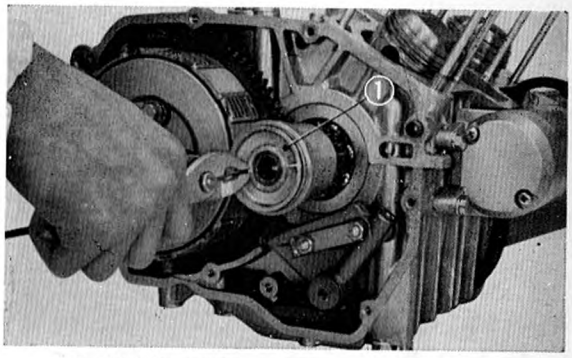


① Oil filter rotor ② 46×2 Oring ③ Oil filter cap
Fig. 3-67. Oil filter

B. Disassembly

Remove the right crankcase cover in accordance with Section 3.4. B. For cleaning of the centrifugal oil filter, only the removal of the oil filter cover is required.

1. Grasp the rib of the oil filter cap ① with a plier and draw straight out. **(Fig. 3-68)**
2. Use a screwdriver and unlock the lock washer.
3. Remove the mounting nut with a special tool.
4. Pull off the oil filter rotor.



① Oil filter cap
Fig. 3-68. Removing the oil filter cap

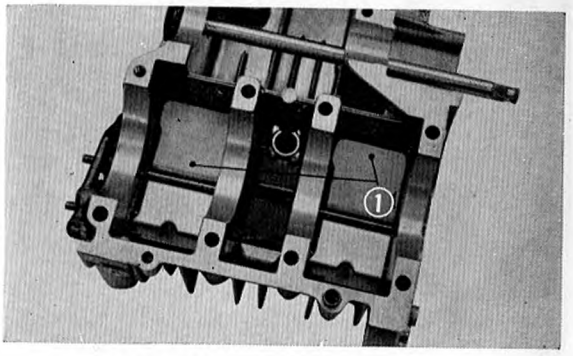
C. Reassembly

1. After cleaning of all the parts, perform the reassembly in the reverse order of disassebly.
2. Make sure that the 16 mm mounting nut is properly torqued and filter cap well seated.

3. OIL SEPARATOR

A. Operation

The oil separator ① is located in the forward section of the lower crankcase, directly below the crankshaft. Its primary function is to control the oil splashed by crankshaft counter weights, prevents oil penetration and controls the oil temperature. **(Fig. 3-69)**



① Oil separator
Fig. 3-69. Lower crankcase

3.6 CRANKCASE

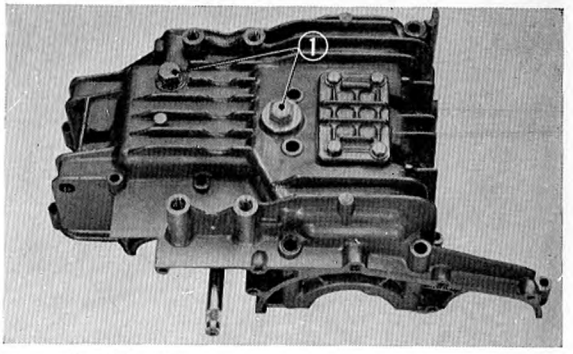
A. Description

The upper and lower crankcases are constructed of lightweight aluminum alloy and can be separated at the center lines of the crankshaft, transmission shaft, and the kick starter spindle.

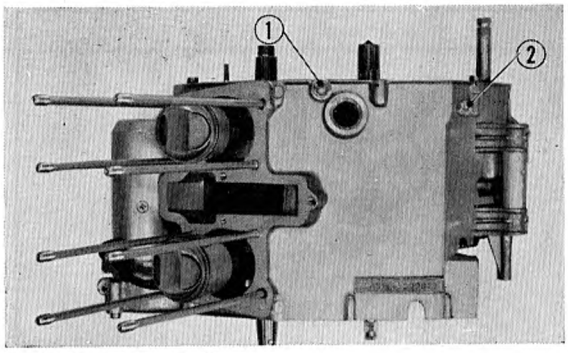
In addition, the starting motor is mounted at the left front section of the CD175 crankcase.

In the upper surface of the upper crankcase, the cylinder stud bolts are inserted.

The lower crankcase is equipped with the oil separator, lower crankcase cover, and two drain plugs. **(Fig. 3-70)**



① Drain plug
Fig. 3-70. Drain plugs



① 8 mm nut ② 6 mm nut
Fig. 3-71A. Crankcase bolt

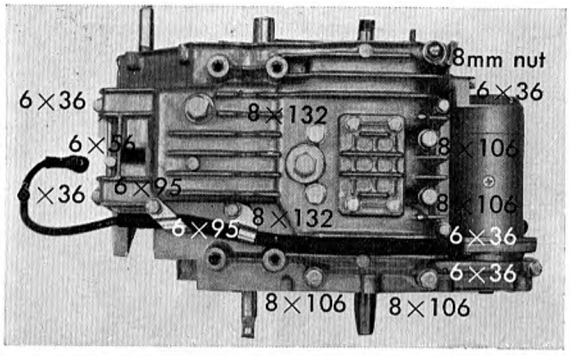
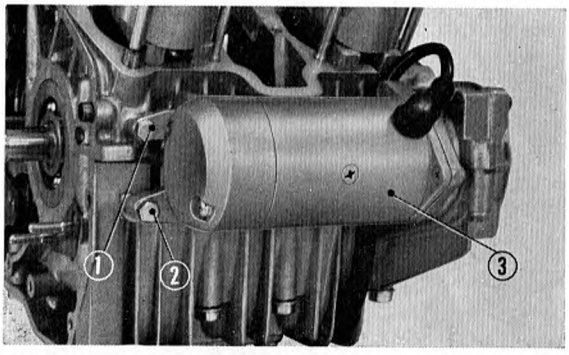


Fig. 3-71B. Bolts and nuts on the lower crankcase



① 6×20 hex bolt ② 6×28 hex bolt ③ Starting motor
Fig. 3-72. Removing the starting motor

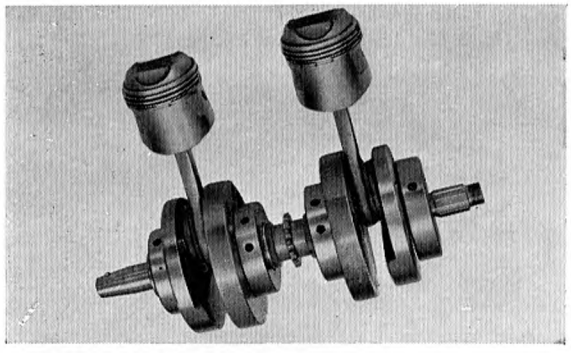


Fig. 3-73A. Crankshaft.

B. Disassembly

1. Drain oil in the crankcase.
2. Remove the cylinder head and cylinder.
3. Separate the left crankcase cover and AC generator.
4. Separate the right crankcase cover, oil filter, clutch and oil pump.
5. Remove 8 mm nut and 6 mm nut from the stud bolts at the upper part of the upper crankcase. **(Fig. 3-71-A)**
6. Remove 8 mm nut, 6 mm bolts and 8 mm bolts from the lower crankcase. **(Fig. 3-71-B)**
7. Remove the 6×20 and 6×28 bolts on the right hand side of the crankcase which mount the starting motor. **(Fig. 3-72)**
8. By removing the 6×35 bolt on the left hand side at the starting motor which is supported by the crankcase, the starting motor can be removed.
9. While the key on the gear shift arm is released from the shift drum, dismount the motor.

C. Inspection

1. Check for damages especially around the machined mating surfaces since even a small defect will cause oil leaks.

   The mating surfaces should be flat to within 0.05 mm (0.002 in). Measure with a thickness gauge on surface plate.

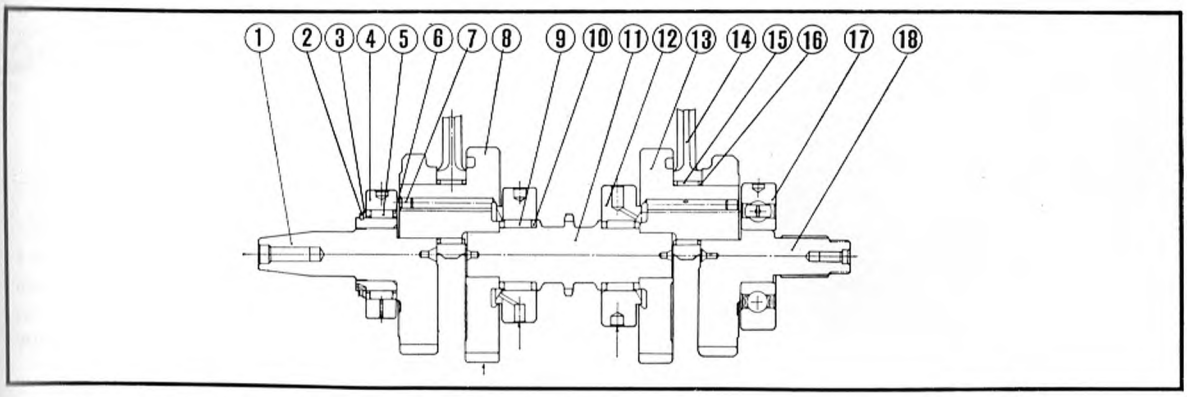
D. Reassembly

1. Assembly should be performed with attention paid to the following points:
   - Clean the crankcase and inspect the mating surfaces of the crankcase for sign of leaks, scratches and other damages.
   - Apply liquid gasket to the mating surfaces of the case; assemble after drying.

3.7 CRANKSHAFT, CONNECTING RODS, AND PISTONS

A. Construction

The crankshaft journals are made of high carbon steel and the counterweights are of nickel-chrome-molybdenum steel, assembled by press fitting. Crankshaft is supported by three roller bearings and one ball bearing which takes the thrust load and are fixed in place by dowel pins. Sprocket to drive the cam chain is machined on the center shaft. **(Fig. 3-73A, B)**



① Left crankshaft ② 35 mm circlip ③ 35 mm side washer ④ L. main bearing outer ring ⑤ 4×10 roller
⑥ L. main bearing roller retainer ⑦ 5 mm sealing washer ⑧ Left center crank weight ⑨ 4×13 roller
⑩ Center bearing roller retainer ⑪ Center crank shaft ⑫ R. center crank outer ring ⑬ Right center crank weight
⑭ Connecting rod ⑮ 2.5×10 roller ⑯ Connecting rod roller retainer ⑰ 6305 SHS ball bearing ⑱ Right crankshaft
Fig. 3-73B. Crankshaft complete sectional diagram

The oil outlet passage in the upper crankcase is aligned to the oil annular groove in the crank counterweight. Oil is forced into the crankpin by centrifugal force to lubricate the connecting rod bearing. There is also a separate oil route to lubricate the main bearings. **(Fig. 3-74)**

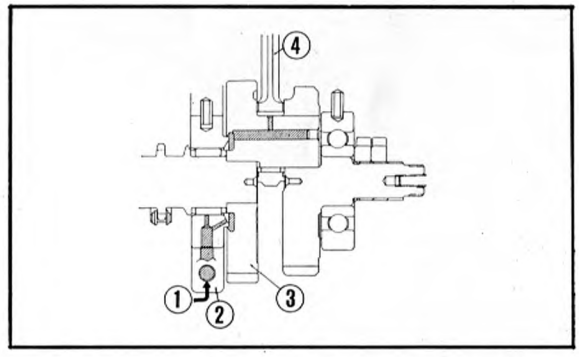
B. Disassembly

1. Drain oil from the crankcase.
2. Separate the cylinder head and cylinder.
3. Separate the left and right crankcase cover.
4. Separate the AC generator and clutch oil pump.
5. Disassemble the crankcase in accordance with section 3-6B.

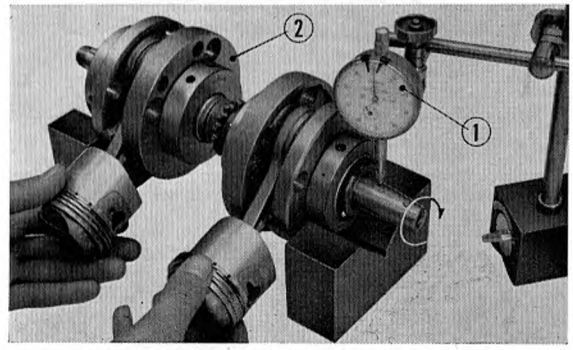
C. Inspection

1. Support the crankshaft on V blocks at both bearings and measure the amount of runout. **(Fig. 3-75)**

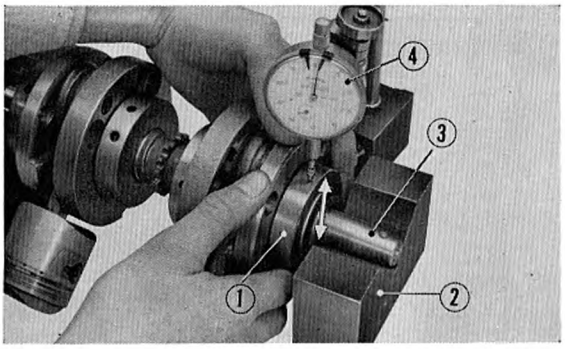
Item		Standard Value	Serviceable Limit
Total runout	Left bearing web side at 30 mm (1.3 in)	0.02 mm (0.0008 in)	Replace or repair if over 0.08 mm (0.0032 in)
	Right bearing web side at 30 mm (1.3 in)	0.02 mm (0.0008 in)	Replace or repair if over 0.08 mm (0.0032 in)



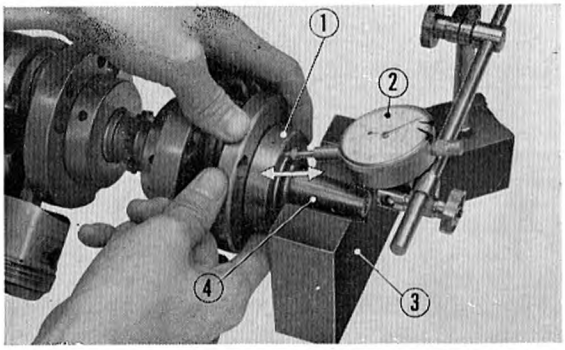
① Oil ② Center crank outer ring ③ Crank weight
④ Connecting rod
Fig. 3-74. Crankshaft lubricating passage



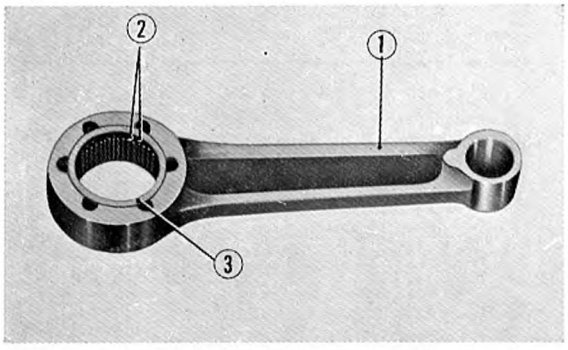
① Dial gauge ② Crankshaft complete
Fig. 3-75. Measuring the shaft runout



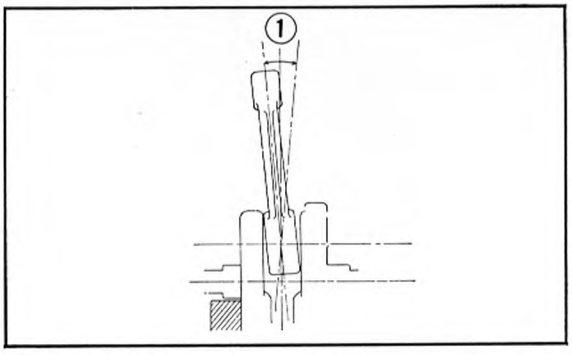
① Main bearing outer ring ② V block ③ Crankshaft
④ Dial gauge
Fig. 3–76. Checking the crankshaft for vertical clearance



① Main bearing outer ring ② Dial gauge ③ V block
④ Crankshaft
Fig. 3–77. Checking the crankshaft for side clearance



① Connecting rod ② Roller ③ Retainer
Fig. 3–78.



① Max deflection
Fig. 3–79. Checking deflection at the piston end of the connecting rod

2. The clearance in the bearing is measured by fixing the crankshaft on centers and moving the bearing in the axial and vertical direction. **(Fig. 3–76, 3–77)**

Item	Standard Value	Serviceable Limit
Axial clearance	Within 0.05 mm (0.0020 in)	Replace if over 0.1 mm (0.0040 in)
Clearance normal to axis	0.012~0.02 mm (0.0005~0.0008 in)	Replace if over 0.05 mm (0.0020 in)

When the clearance in the axial direction becomes excesslve, the crankshaft will move from side when engine is running and produce undersirable noises as well as causing uneven wear to the cylinder, piston and the timing gear.

2. CONNECTING RODS

A. Description

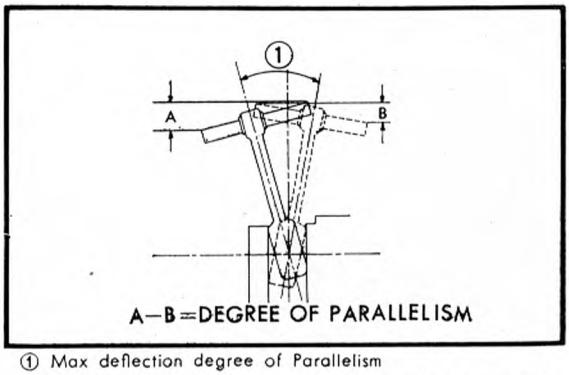
The connecting rods are of molybdenum steel and have an H–shaped section; the roller bearings at the crankshaft end. The crankshaft is polished after case hardening and mounts the roller without race. The roller (2.5×10) is held by the roller retainer made of special aluminum alloy. Staggered rollers are used in order to increase the load capacity. **(Fig. 3–78)**

B. Inspection

1. Measurement of deflection at the piston end of the connecting rod. **(Fig. 3–79)**

Item	Standard Value	Serviceable Limit
Deflection		Replace if over 3.0 mm (0.1181 in)

2. Measurement to determine if the connecting rod ends are correctly aligned and parallel is obtained by measuring the difference of inclination of points 50 mm (2.0 in) away from the center when a 100 mm (4.0 in) bar with the same thickness as the piston pin diameter is inserted into the bore of the piston end and twisted to the right and left, and when the bar is rotated 90° and again twisted to the right and left. **(Fig. 3-80)**

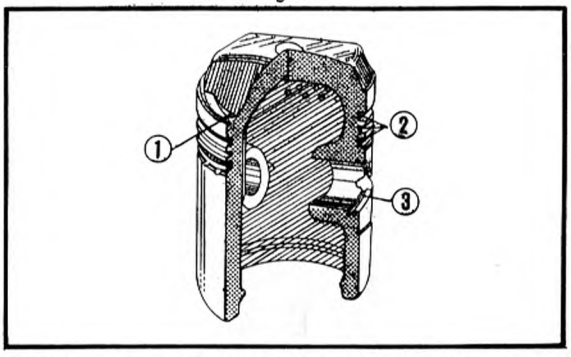


① Max deflection degree of Parallelism
Fig. 3-80. Checking level of parallel at the piston end of the connecting rod

3. PISTON

A. Description

The piston is made from select material, an aluminum casting. This material is light and suitable for high speed, in addition to having good heat conducting property to dissipate the heat rapidly. Furthermore, the coefficient of heat expansion is small thus minimizing the warpage at elevated temperature and permitting a small piston to cylinder clearance design. The shape of the piston is an elliptical taper. The head of the piston, compared to the skirt, is exposed to higher temperature and since the expansion is greater, it is taperingly smaller toward the top. The tapering of the piston also tends to lessen the piston slap when the throttle is lightly snapped without the engine being loaded. **(Fig. 3-81)**



① Valve escape ② Piston ring grooves ③ Piston pin hole
Fig. 3-81. Piston

The piston employs a four step taper. The piston pin boss area is made thicker thereby resulting in greater expansion at high temperature. For this reason, the diameter of the piston skirt is made smaller in the direction of the piston pin so that at the high oprating temperature, the piston will expand into a true circular shape. The skirt is constantly provided with flexibility to assure that no deformation will result even from extended continuous driving.

The piston pin is offset 1 mm (0.04 in) from the piston centerline in the direction of the inlet side so that when the piston approaches the top dead center of the compression stroke, the side load from the cylinder moves from the right side to the left. With a "O" offset, the point will move to align with the top-dead-center of the compression stroke.

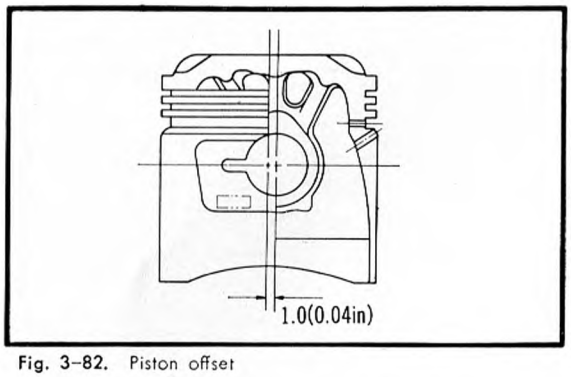
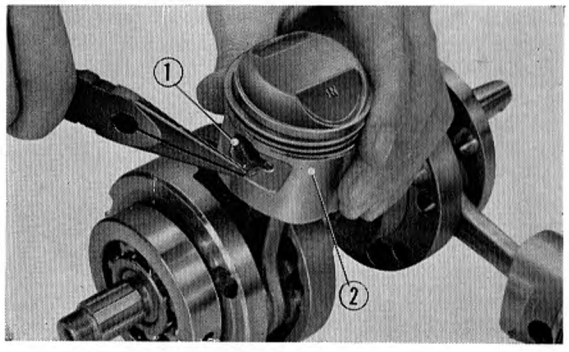


Fig. 3-82. Piston offset

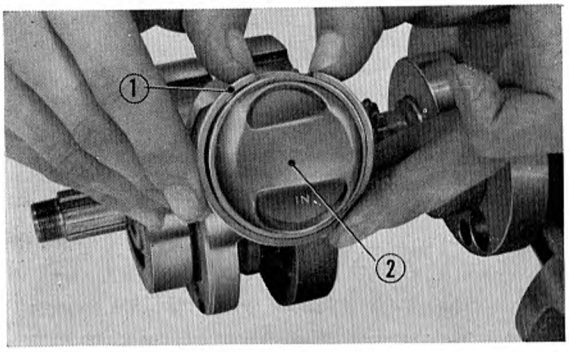
As shown in **Fig. 3-82**, the point of maximum combustion pressure occurs after the top-dead-center, therefore, the purpose of the offset is to move the point toward the point of weaker pressure which is before top-dead-center, and by so doing, escapes the powerful pressure movement and makes it possible to eliminate the piston slap.

B. Disassembly

1. Remove the piston pin clip and push out the piston pin. **(Fig. 3-83)**



① Piston pin clip ② Piston
Fig. 3-83. Removing the piston pin



① Piston ring ② Piston
Fig. 3–84. Removing the piston ring

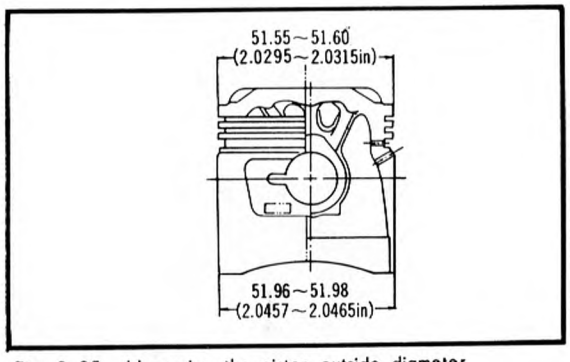
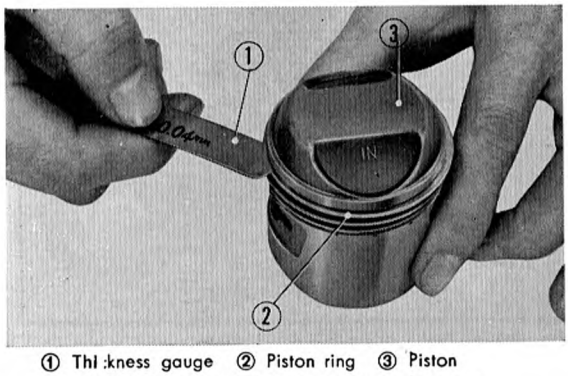
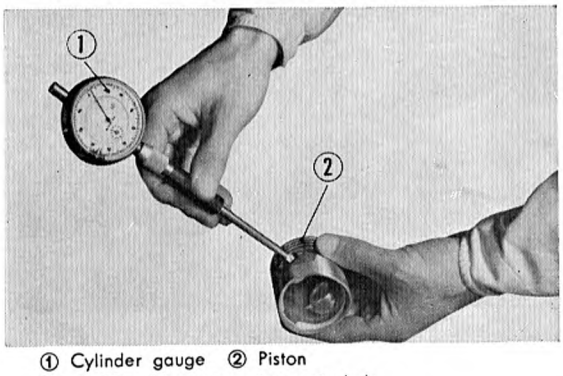


Fig. 3–85. Measuring the piston outside diameter



① Thickness gauge ② Piston ring ③ Piston
Fig. 3–86. Measuring the ring groove clearance



① Cylinder gauge ② Piston
Fig. 3–87. Measuring piston pin hole

2. Remove the piston rings from the piston by using a piston ring tool (special tool). If the tool is not available, the rings may be removed by hand, spreading the rings at the ring opening with both hands. During the process, the ring should not be twisted or expanded more than necessary as it will cause the ring to break. **(Fig. 3–84)**

C. Inspection

1. Before inspection, carbon adhering to the piston head or ring groove should be removed, using care not to scratch the piston.

(Note)

Sandpaper should not be used for removing carbon, use a carbon scraper.

2. Piston outside diameter **(Fig. 3–85)**

Item	Standard Value	Serviceable Limit
Head diameter	51.55~51.60 mm (2.0295~2.0314 in)	
Major diameter	51.96~51.98 mm (2.0457~2.0465 in)	

3. Ring groove clearance when a new piston ring is fitted. **(Fig. 3–86)**

Item	Standard Value	Serviceable Limit
Top ring	0.025~0.055 mm (0.001~0.00 in)	Replace if over 0.1 mm (0.004 in)
Second ring	0.015~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 mm (0.004 in)
Oil ring	0.010~0.045 mm (0.0004~0.0018 in)	Replace if over 0.1 mm (0.004 in)

4. Piston pin hole **(Fig. 3–87)**

Item	Standard Value	Serviceable Limit
Bore	14.002~14.008 mm (0.551~0.552 in)	Replace if over 14.05 mm (0.5532 in)

5. For oversize pistons, there are three at intervals of 0.25 mm (0.01 in).

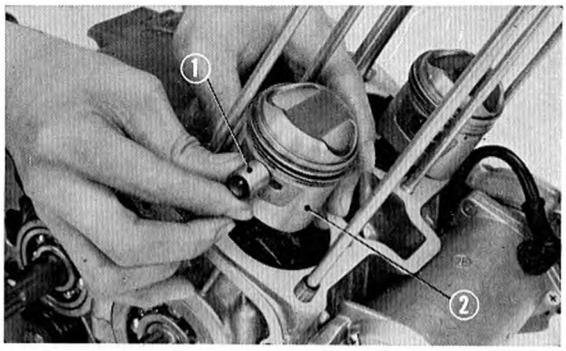
D. Reassembly

1. Assemble the piston on the connecting rod, only a slight pressure should be required to install the piston pin. Install the piston pin retaining clip at both ends. **(Fig. 3-88)**

(Note)

(a) The top of the piston is marked with "IN" to one side. Piston must be installed with this mark toward the inlet side.

(b) Use the new piston pin clips.



① Piston pin ② Piston
Fig. 3-88. Assembling the piston

4. PISTON RINGS

A. Construction

The piston rings perform a vital function of forming a seal between the piston and cylinder, controlling the lubrication of the cylinder wall and dissipating the heat from the piston. This serves to develop greater power output.

The rings are made of special cast iron for strength, wear resistance, heat resistance and good heat conducting qualities. Rings are given parkerizing treatment for added strength.

Top two rings are compression rings to prevent gas leak; these two rings are made with a slight tapered surface where it contacts the cylinder wall to expedite wearing-in, top ring outer surface is hard chrome plated for extra wear.

The oil ring is grooved for oil scraping.

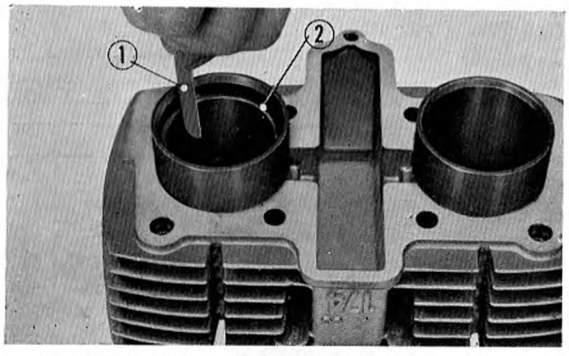
B. Inspection

1. When the piston ring has been removed, it should be fitted with the gap approximately 15 mm (0.6 in) from skirt of the cylinder at a right angle to the center line. Measurement of the gap should be made with a thickness gauge. **(Fig. 3-89)**

Item	Standard Value	Serviceable Limit
Top ring	0.15~0.4 mm (0.006~0.018 in)	Replace if over 0.8 mm (0.0315 in)
Second ring	0.15~0.4 mm (0.006~0.016 in)	Replace if over 0.8 mm (0.0315 in)
Oil ring	0.15~0.4 mm (0.006~0.016 in)	Replace if over 0.8 mm (0.0315 in)

2. Tension of the piston ring is measured with a tension measuring instrument.

Item	Standard Value	Serviceable Limit
Top, Second ring	0.52~0.78 kg (0.020~0.030 in)	Replace if under 0.42 kg (0.926 lb)
Oil ring	0.72~10.08 kg (0.028~0.397 in)	Replace if under 0.53 kg (1.169 lb)



① Thickness gauge ② Piston ring
Fig. 3-89. Measuring the piston ring gap

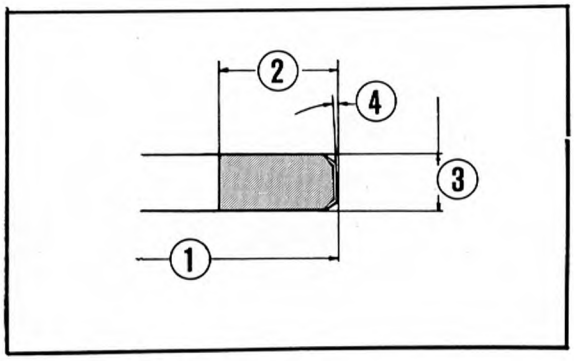


Fig. 3-90A. Piston ring (Top)

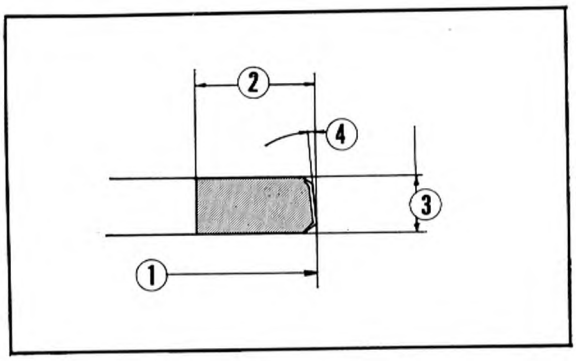


Fig. 3-90B. Piston ring (Second)

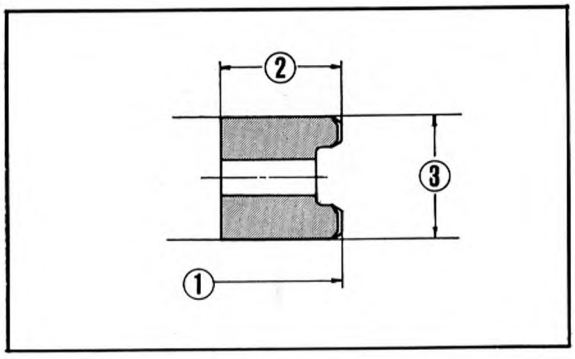


Fig.3-90C. Piston ring (Oil)

3. Piston ring dimensions. **(Fig. 3-90A, B, C)**

	No.	Item	Standard Value	Serviceable Limit	Mark
TOP RING	①	Outside dia (Standard)	52.00 (2.047 in)		None
		Outside dia 0.25 (Oversize)	52.25 (2.057 in)		25
		Outside dia 0.50 (Oversize)	52.50 (2.067 in)		50
		Outside dia 0.75 (Oversize)	52.75 (2.077 in)		75
		Outside dia 1.00 (Oversize)	53.00 (2.087 in)		100
	②	Width	2.3~2.5 (0.091~0.098 in)		
	③	Thickness	1.165~1.18 (0.046~0.0464 in)	1.125 (0.0443 in)	
	④	Angle	20'~50'		
SECOND RING	①	Outside dia (Standard)	Same as top ring		
		Outside dia 0.25 (Oversize)			
		Outside dia 0.50 (Oversize)			
		Outside dia 0.75 (Oversize)			
		Outside dia 1.00 (Oversize)			
	②	Width	2.3~2.5 (0.091~0.098 in)		
	③	Thickness	1.175~1.19 (0.046~0.047 in)	1.135 (0.0447 in)	
	④	Angle	1°~1°30'		
OIL RING	①	Outside dia (Standard)	Same as top ring		
		Outside dia 0.25 (Oversize)			
		Outside dia 0.50 (Oversize)			
		Outside dia 0.75 (Oversize)			
		Outside dia 1.00 (Oversize)			
	②	Width	2.3~2.5 (0.091~0.098 in)		
	③	Thickness	2.475~2.49 (0.097~0.098 in)	2.43 (0.0957 in)	
	④	Angle	None		

C. Replacing the piston rings

1. When a piston ring is reassembled, it should be fitted to the cylinder. Inspection should be made to determine if the gap of each ring is between 0.15 mm (0.006 in) and 0.4 mm (0.018 in). If the gaps are somewhat less, they should be dressed with a file.

(Caution)

(a) When a gap is dressed with a file, adjustment should be made perpendicular to the rings.

(b) If the piston ring gap is too small, seizure between the ring and cylinder occurs due to thermal expansion; if the gap is too large, oil penetration or gas leakage occurs.

2. When piston ring is assembled on the piston, any interference between the ring and the groove may prevent smooth operation. It is necessary to inspect for clearance, when new ring is fitted to the groove, by rotating the ring around the circumference. **(Fig. 3–91)**

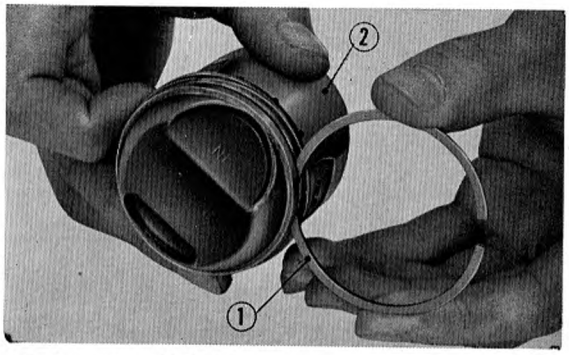
3. Install the rings on the piston with the piston ring tool, the rings may also be installed manually. Install the bottom ring first.

(Caution)

(a) Care should be exersized not to install the rings upside down. The top side of the ring is marked near the ring opening with the manufacturers initials. **(Fig. 3–92)**

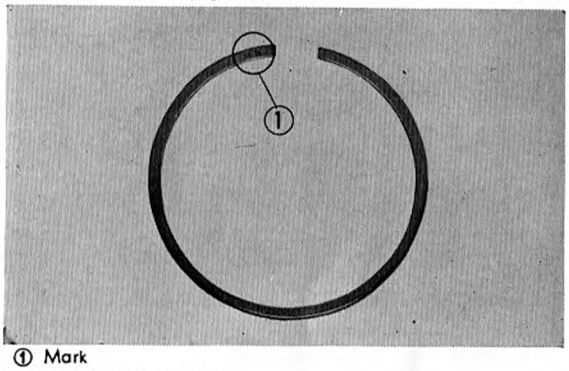
(b) Worn or rings which has lost its tension should be replaced.

4. Space the piston ring gaps 120° apart. Aligning of the gaps will result in pressure leak.



① Piston ring ② Piston

Fig. 3–91. Inspection of the piston ring by rotating around the ring groove



① Mark

Fig. 3–92. Piston ring

3.8 CAM CHAIN TENSIONER AND CAM CHAIN GUIDE ROLLER

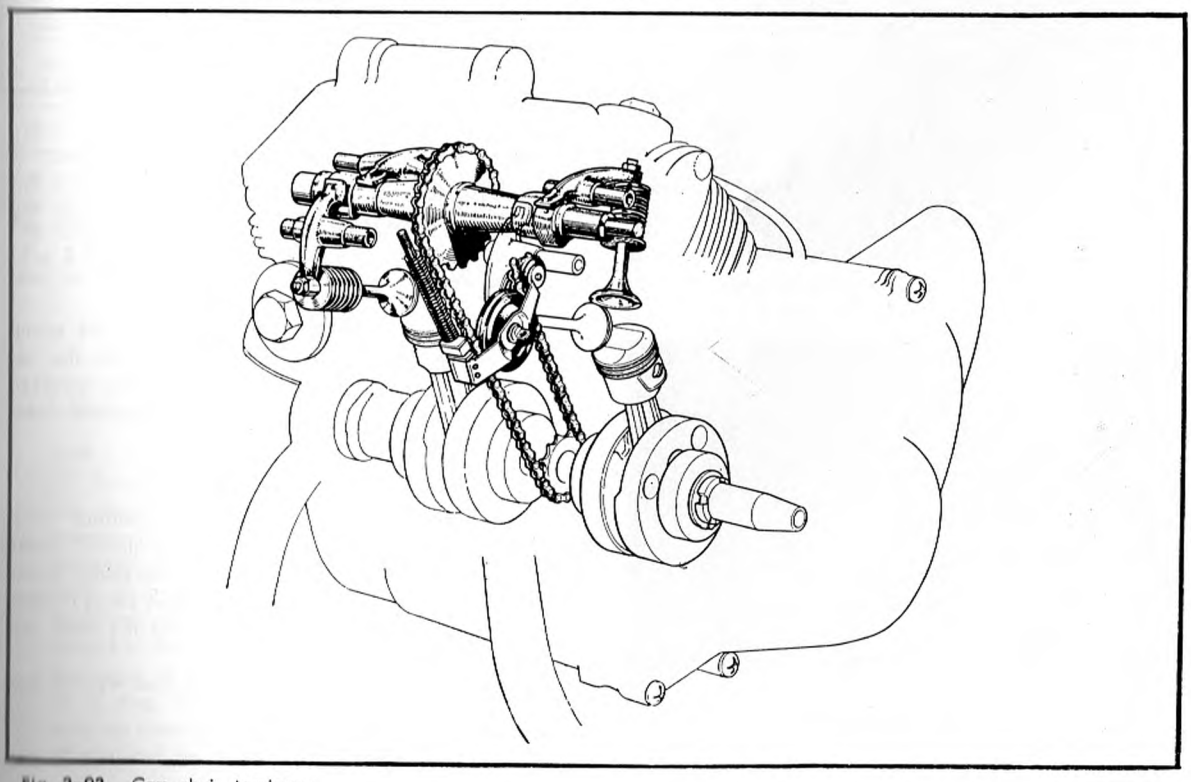


Fig. 3–93. Cam chain tensioner

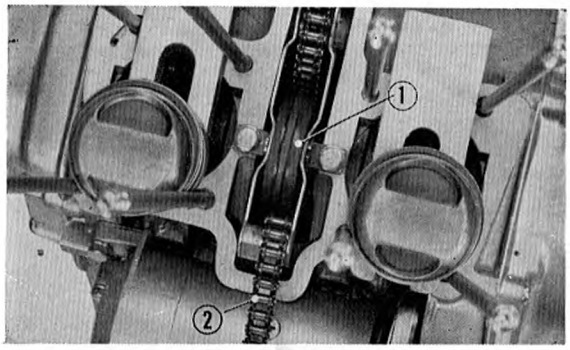
1. CAM CHAIN TENSIONER

A. Operation

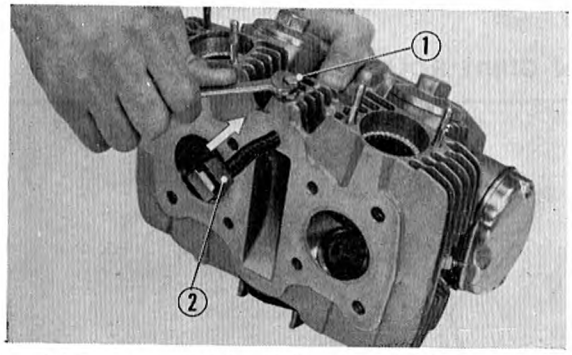
The cam chain tightener is used to tighten the cam chain from the outer side with the cam chain guide roller in between.

As shown in the figure, the tightener push bar is automatically under compression by the cam chain tensioner spring and supports one end of the tightener.

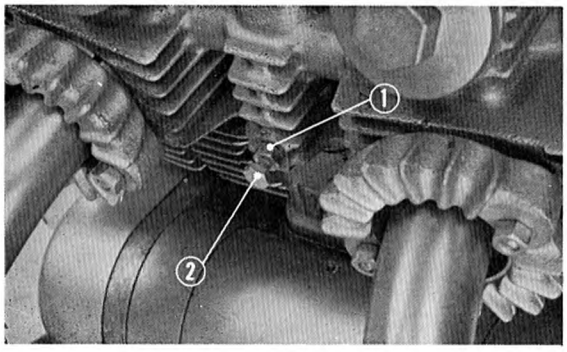
On the other hand, the tensioner roller is applying pressure against the cam chain. When the tensioner set bolt is loosened, the tensioner push bar automatically takes up the slack of the cam chain by applying force from the spring. **(Fig. 3-93)**



① Cam chain guide roller ② Cam chain
Fig. 3-94. Cam chain tensioner



① Tensioner set bolt ② Tensioner push bar
Fig. 3-95. Assembling the tensioner push bar



① Lock nut ② Tensioner set bolt
Fig. 3-96. Adjusting the cam chain

B. Disassembly

1. Separate the cylinder head and cylinder.
2. Tie a wire across the ends of the cam chain.
3. Remove the two 6×20 bolts mounting the cam chain guide roller and separate the cam chain tensioner from the crankcase.
4. The cam chain guide roller is coupled to the cam chain tensioner and remove the cam chain guide roller pin and then separate the cam chain tensioner. **(Fig. 3-94)**
5. When the 5 mm thin nut is loosened and the tensioner set bolt is removed, the tensioner push bar coupled to the cylinder head is separated together with the tensioner spring. **(Fig. 3-95)**

C. Inspection

1. Check the cam chain tensioner for any damage or wear.

Item	Standard Value	Serviceable Limit
Tensioner spring free length	83 mm (3.268 in)	Replace if under 80 mm (3.1496 in)
Tension	41 mm/0.55~0.65kg (1.614 in/1.21~1.43 lbs)	—

D. Reassembly

1. Perform the assembly in the reverse order of disassembly.
   a. Replace any worn or damaged guide or tensioner roller.
   b. Assemble the tensioner push bar and spring into the cylinder head and lock with the set bolt. The push bar should be in the retracted position to facilitate connecting the cam chain. **(Fig. 3-95)**

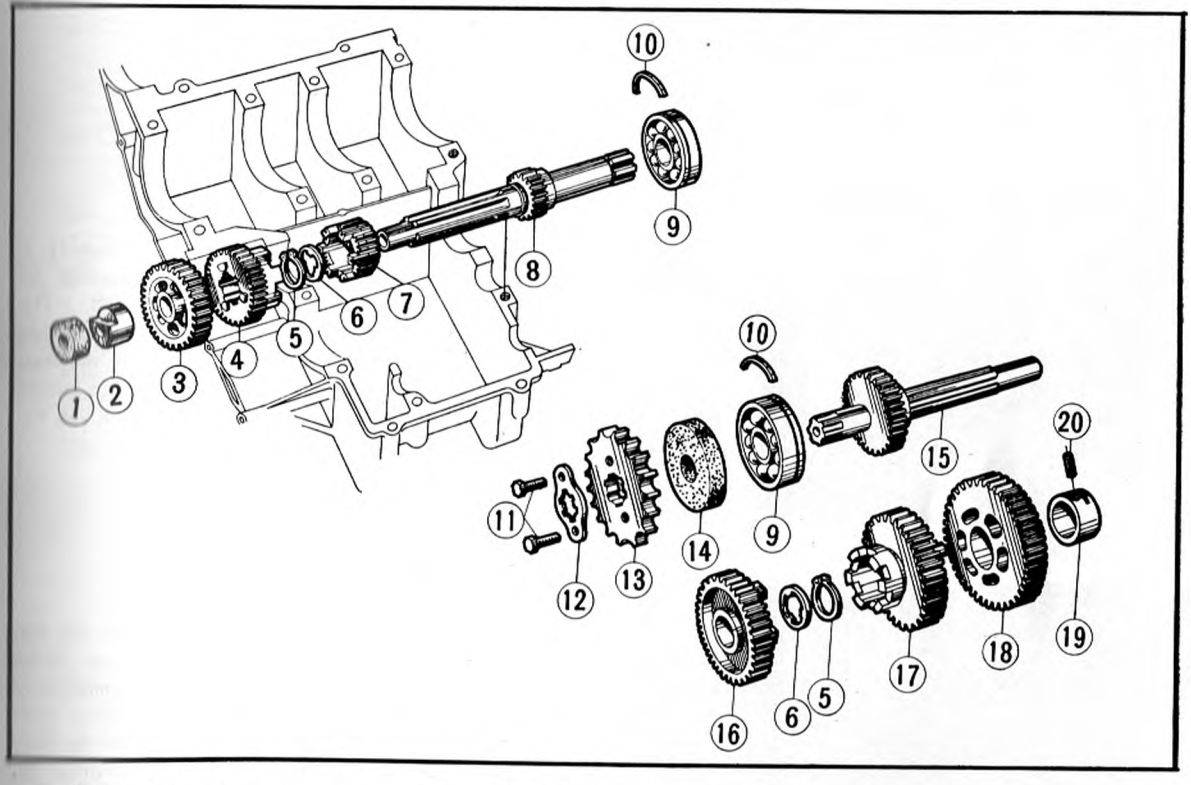
E. Cam chain tension adjustment

1. Align the "T" mark on the A.C. generator rotor to the arrow index mark on the stator. Make sure that the piston is on the compression stroke (this can be checked by the valves being closed).
2. Loosen the tensioner set bolt and the chain will tighten automatically.
3. Reset the tensioner set bolt and lock with the lock nut. **(Fig. 3-96)**

3.9 TRANSMISSION

A. Description

The transmission receives the rotary power from the crankshaft and through a series of gears, changes it to the desired speed and then transmits it to the drive sprocket to drive the rear wheel. All the gears are fully-constant-meshed, assuring smooth gear change. **(Fig. 3-97)**



① 8×25×8 oil seal ② 15 mm bearing bushing A ③ Main shaft fourth gear ④ Main shaft third gear ⑤ 20 mm set ring.....2 each ⑥ 20 mm thrust washer A.....2 each ⑦ Main shaft second gear ⑧ Transmission main shaft ⑨ 6304 boll bearing ⑩ Ball bearing set ring A...2 each ⑪ 6×10 hex bolt ⑫ Drive plate fixing plate ⑬ 16T drive sprocket ⑭ 20×52×9 TC oil seal ⑮ Transmission counter shaft ⑯ Counter shaft third gear ⑰ Countershaft second gear ⑱ Countershaft low gear ⑲ 15 mm bearing bushing B ⑳ 6 mm guide pin

Fig. 3-97. Transmission

1. OPERATION

Low : **(Fig. 3-98)**

The power from the crankshaft is transmitted through the clutch to the spline fixed driven gear on the transmission main shaft ①. The power from the transmission main shaft ① is transmitted from the main shaft drive gear to the counter shaft low gear ②. However, the counter shaft second gear ③ which is splined to the counter shaft and is moved against the low gear ② by the shift fork and is locked by means of a dog, forming an single unit with the counter shaft to transmit the driving force to the drive sprocket ④ mounted on the left end of the counter shaft.

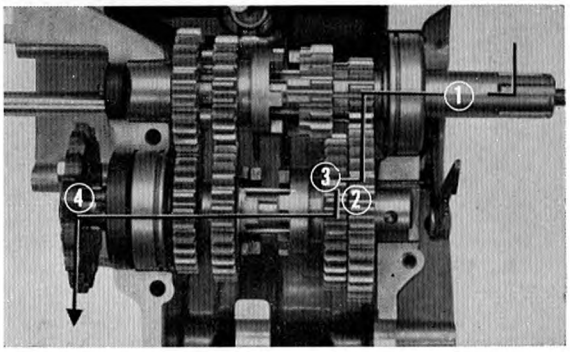


Fig. 3-98. Low gear

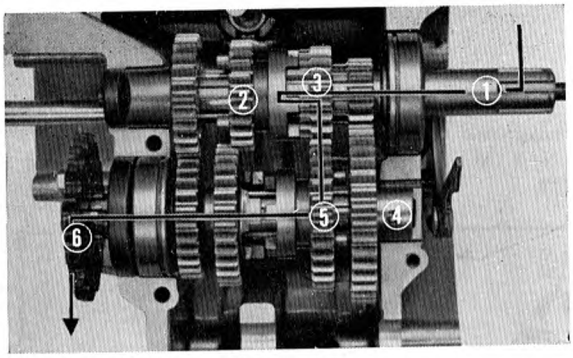


Fig. 3-99. Second gear

Second : **(Fig. 3-99)**

The main shaft third gear ② which is spline slide fitted to the main shaft ① is moved by the shift fork to lock with the second gear ③ by means of a dog, thus permitting the transmission of power from the main shaft to the counter shaft ④ by meshing the main shaft second gear with the splined counter shaft second gear ⑤ hence to drive the sprocket ⑥.

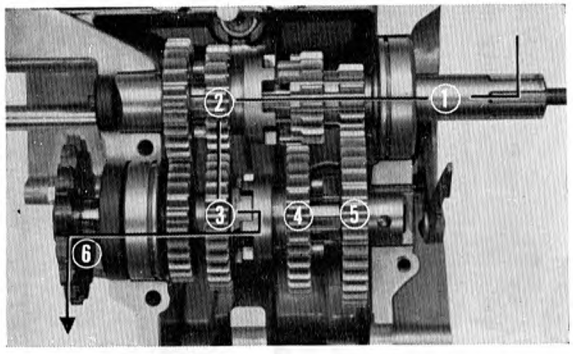


Fig. 3-100. Third gear

Third : **(Fig. 3-100)**

The power from the transmission main shaft ① is transmitted to the counter shaft third gear ③ by meshing with the main shaft third gear ②. The counter shaft second gear ④ which is spline slide fitted is moved by the shift fork to lock with the free rotating third gear ③ by means of a dog, this causes the counter shaft ⑤ to rotate and in turn drives the sprocket ⑥.

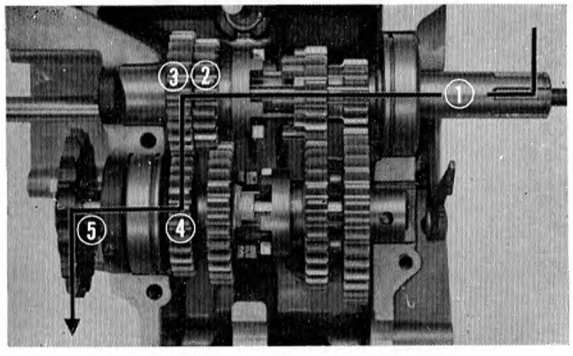


Fig. 3-101. Top gear

Top : **(Fig. 3-101)**

The main shaft third gear ② is moved by the shift fork to lock with the free rotating top gear ③ by means of a dog, thus permitting the transmission of power from the main shaft ① to the counter shaft by meshing the main shaft top gear ③ with the fixed counter shaft ④ (top gear) to drive the sprocket ⑤.

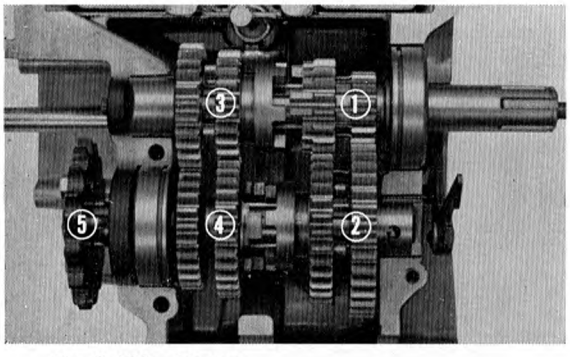


Fig. 3-102. Neutral

Neutral : **(Fig. 3-102)**

The gears are not locked. The main shaft low gear ① is meshed with the counter shaft low gear ② and the main shaft third gear ③ is meshed with counter shaft third gear ④, however, the counter shaft gears rotate freely and therefore no power is delivered to the sprocket ⑤.

B. Disassembly

1. Disassemble the cylinder head and cylinder.
2. Separate the crankcase.

C. Inspection

1. Main shaft to main shaft gear clearance.

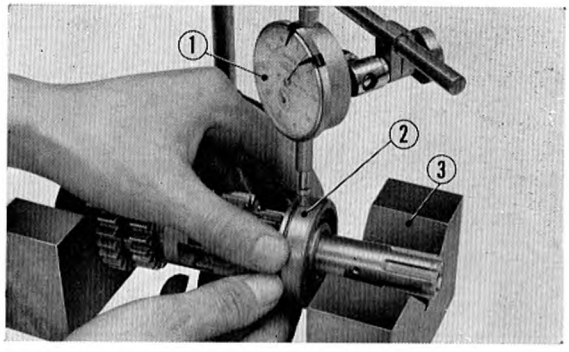
Item	Standard Value	Serviceable Limit
Second gear	0.02~0.062 mm (0.0008~0.0024 in)	Replace if over 0.1 mm (0.004 in)
Top gear	0.016~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 mm (0.004 in)

2. Counter shaft to counter shaft gear clearance.

Item	Standard Value	Serviceable Limit
Low gear	0.016~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 mm (0.004 in)
Second gear	0.020~0.062 mm (0.0008~0.0024 in)	Replace if over 0.1 mm (0.004 in)

3. Bearing clearance. **(Fig. 3-103)**

Item	Standard Value	Serviceable Limit
Axial clearance	Within 0.05 mm (0.002 in)	Replace if over 0.1 mm (0.004 in)
Radial clearance	0.01~0.025 mm (0.0004~0.0010 in)	Replace if over 0.05 mm (0.002 in)



① Dial gauge ② Bearing ③ V block
Fig. 3-103. Measuring clearance of the bearing

4. Shift drum groove. **(Fig. 3-104)**

   Standard value : 6.1~6.2 mm (0.240~0.244 in)
   Serviceable limit : 6.4 mm (0.256 in)

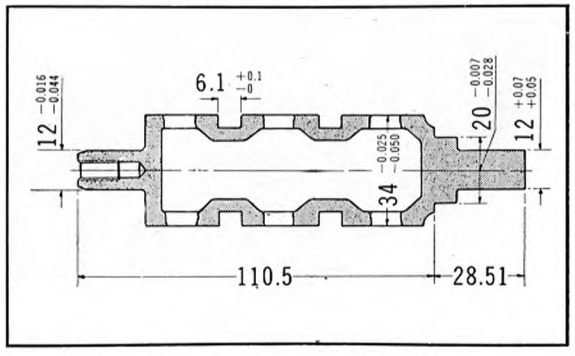
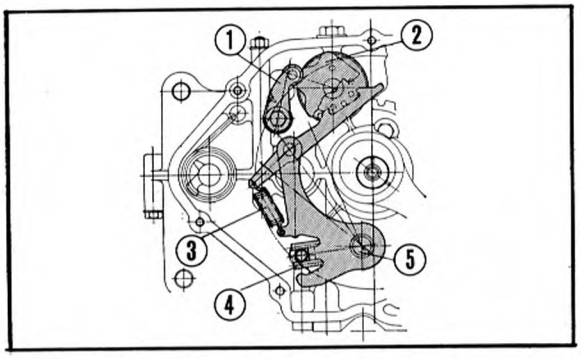


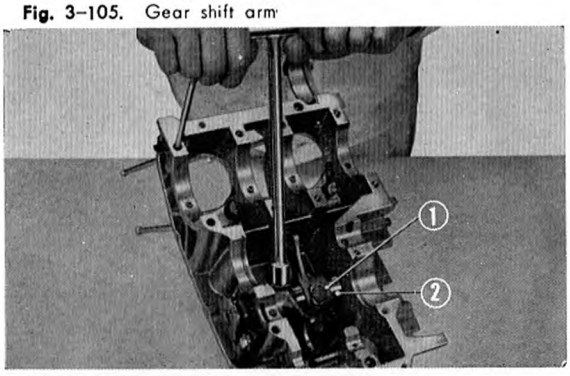
Fig. 3-104. Measuring the shift drum groove

D. Reassembly

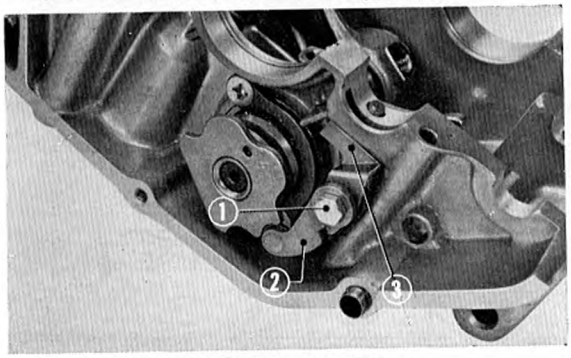
1. Assemble the transmission gears in the reverse order of removal.
2. After assembly, all components should be checked to assure that the operation is smooth without any binding.
3. Inspect the mating surfaces of the crankcase for any scratches or damage which will be a source of oil leak.



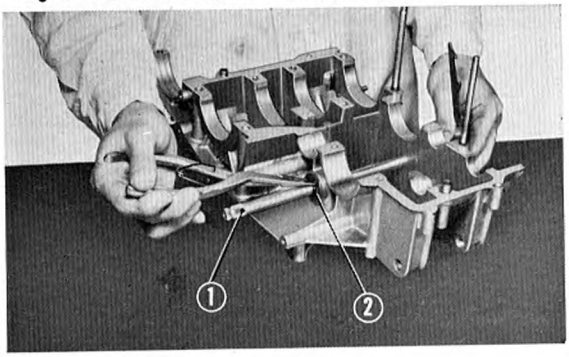
① Shift drum stopper ② Gear shift drum
③ Gear shift arm spring ④ Gear shift return spring
⑤ Gear shift spindle comp.
Fig. 3–105. Gear shift arm



① Shift fork guide pin ② Gear shift drum
Fig. 3–106. Removing the shift fork guide pin



① 6×20 hex bolt ② Shift drum stopper
③ Stopper arm plate
Fig. 3–107. Removing the shift drum stopper



① Gear shift spindle ② 12 mm set ring
Fig. 3–108. Removing the gear shift spindle

3.10 GEAR SHIFT

A. Operation

The gear shift fork is moved linearly by the rotary movement of the gear shift drum. When the gear shift pedal is depressed, the gear shift spindle, through the gear shift arm, causes the shift drum to move either in the clockwise or counter clockwise direction, depending upon whether the forward or rear of the pedal is depressed. The shift forks are fitted over the shift drum and guided in its linear movement by the cam groove on the surface of the shift drum into which the fork guide pins are inserted. Rotation of the drum shifts the forks to the right or left which in turn performs the gear shifting. A gear shift return its normal position after each gear change stroke. **(Fig. 3–105)**

B. Disassembly

1. Disassemble the transmission in accordance with section 3.9. B.
2. Straighten the tabs of the gear shift guide pin and remove the guide pins ①. **(Fig. 3–106)**
3. Remove the neutral switch rotor and stator from the left end of the shift drum.
4. Unscrew 6×20 hex. bolt ① and remove the shift drum stopper ② and stopper arm plate ③ **(Fig. 3–107)**
5. Draw out the gear shift drum.
6. The gear shift spindle and return spring can be removed by removing the set ring from the opposite end of the gear shift spindle. **(Fig. 3–108)**

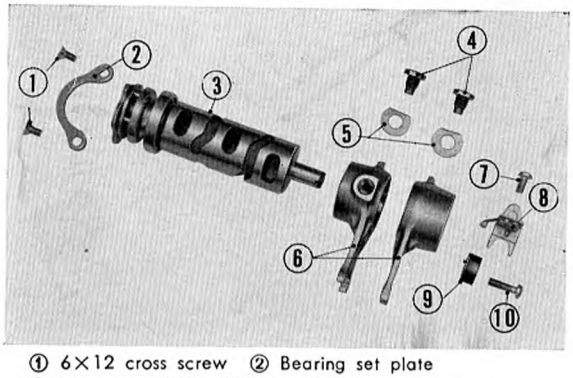
C. Inspection

1. Inspect the gear shift spindle, gear shift arm and gear shift forks for twist or bend.
2. Inspect the gear shift drum and guide pin for excessive wear.
3. Check the springs for breakage and proper tension.

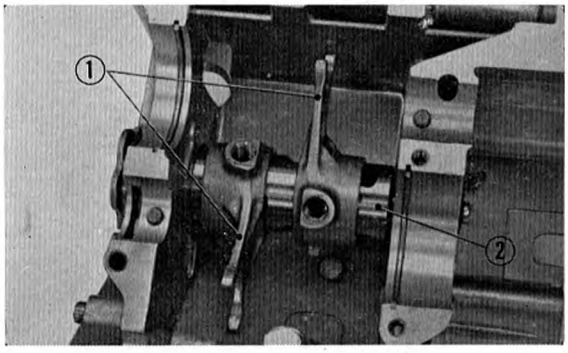
D. Reassembly

1. Insert the gear shift drum at the right side of the upper crankcase and assemble the gear shift fork in the crankcase. **(Fig. 3–109, 3–110)**
2. Assemble the shift fork with the gear shift fork guide pin and position the ear of the lock washer.
3. Assemble the neutral switch rotor and the stator.
4. Assemble the shift drum stopper ; this completes upper case assembly.
5. Assemble the gear shift return spring in the lower crankcase.
6. The gear shift spindle should be inserted together with the return spring from the right side of the lower crankcase. The gear shift spindle side stopper and oil seal should be inserted at the left end of the shift spindle and then install the set ring.
7. Assemble the crankshaft with transmission gears in the upper case and tighten the lower crankcase.
8. Complete the assembly in accordance with section 3.8.

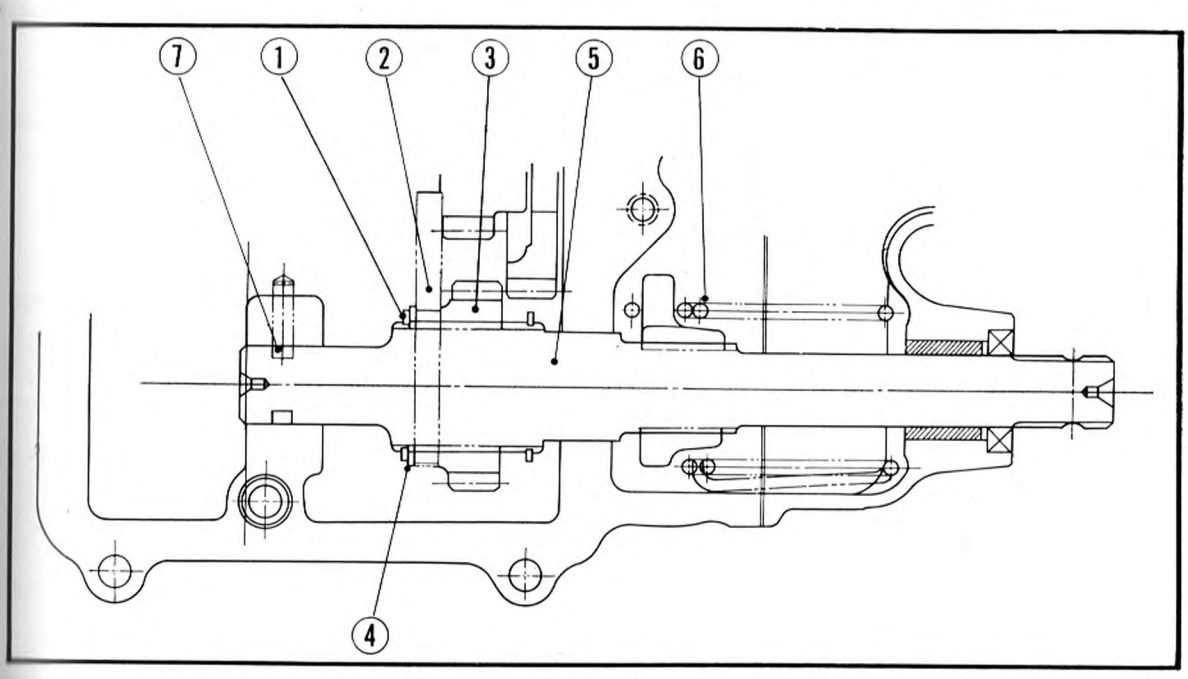
3.11 KICK STARTER



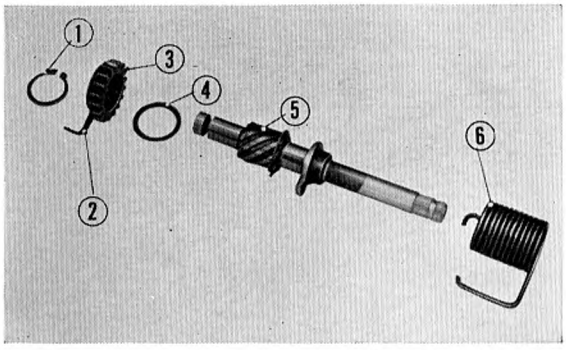
① 6×12 cross screw ② Bearing set plate
③ Gear shift drum ④ Gear shift fork guide pin
⑤ Shift fork lock washer ⑥ Gear shift fork
⑦ 6×12 cross screw ⑧ Neutral switch stator
⑨ Neutral switch rotor ⑩ 6×20 cross screw
Fig. 3–109. Component parts of gear shift drum



① Gear shift fork ② Gear shift drum
Fig. 3–110. Assembling the gear shift fork



① 25 mm cir-clip ② Friction spring ③ Kick starter pinion ④ Kick starter washer ⑤ Kick starter spindle ⑥ Kick starter spring ⑦ 4×15 knock pin **Fig. 3–111A.** Kick starter assembly



① 25 mm cir-clip ② Friction spring ③ Kick starter pinion
④ Kick starter washer ⑤ Kick starter spindle
⑥ Kick starter spring
Fig. 3–111. Disassembling the kick starter

A. Construction

The kick starter pinion engages with the transmission low gear and by utilizing the transmission gears kicking is made easy and does not require much force.

When the kick starter shaft is rotated by the kicking action the serrated kick starter ratchet flange is rotated simultaneously and the pawl of the kick starter ratchet flange slides down from the kick starter guide and is pushed against the kick starter pinion groove by the pawl spring. Power is transferred from the kick starter pinion to the countershaft low gear.

When the kick starter is not depressed or the kick starter pedal is released after kicking, the kick starter ratchet flange is pushed back by the kick starter spring. The pawl rests on the kick starter ratchet guide and the kick starter pinion is freed. **(Fig. 3–111A, B)**

B. Disassembly

1. Separate upper and lower crankcase in accordance with section 3.10. B.
2. Take out the kick starter shaft.
3. Remove the main shaft, countershaft and gear shift drum.

C. Inspection

Check the ratchet and the kick starter pinion ratchet for excessive wear and replace if excessive wear exists.

D. Reassembly

Reassemble the kick starter in the reverse order of disassembly.

Setting specification (CD175, CD175A)

Model carburetor type		PW 22ϕ
Setting mark		A
Main bore		22 mm (0.866 in)
Main jet		# 98
Air jet		# 100
Air bleed	AB 1	1.0ϕ×2
	AB 2	0.7ϕ×2
	AB 3	0.7ϕ×4
Needle jet		2.6ϕ×3.8ϕ
Jet needle		2.545ϕ, 4.00°×3 stage WP
Cut-away		# 3.0 (Width 2.0 mm, depth 0.5 mm)
Air screw		1 1/8 ±1/8
Slow jet		# 40 (0.6ϕ×2×4)
Valve seat		2.0ϕ
Pilot out let		1.0ϕ P=8.5
Fuel level		28 mm (1.1 in)

3.12 CARBURETOR (CD175)

A. CONSTRUCTION

The CD175 is equipped with a variable venturi carburetor operated by a cable from the throttle grip. The choke valve is connected by a linkage.

The operation of the engine creates a vacuum within the cylinder and this draws the outside air into the cylinder after having been passed through the air cleaner where the air is cleaned, through the carburetor where the proper amount of fuel has been mixed to form a combustible mixture and finally enters the cylinder where it is ignited to produce the power necessary to perform work.

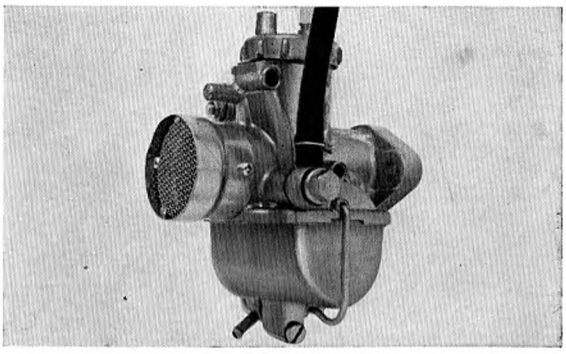


Fig. 3-112. Carburetor

1. FUEL SYSTEM

As the air enters the carburetor, it passes under the throttle valve where vacuum pressure is produced due to the restriction caused by the throttle valve extending into the main air passageway. The fuel discharge outlet is located in this so-called venturi area so that the vacuum pressure can draw out the fuel. This carburetor incorporates both the main and a slow system.

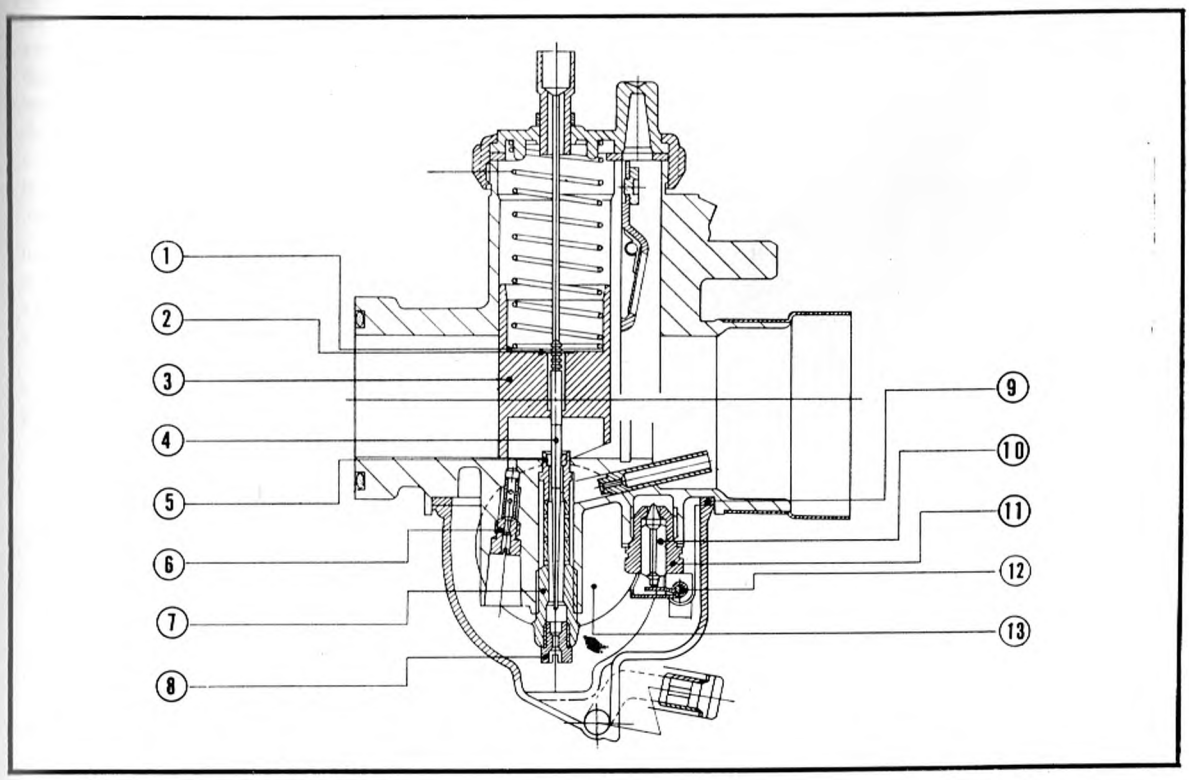
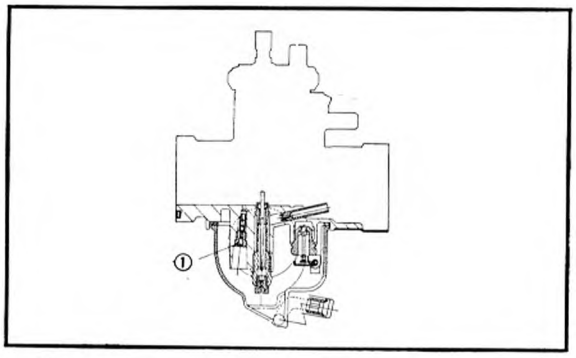
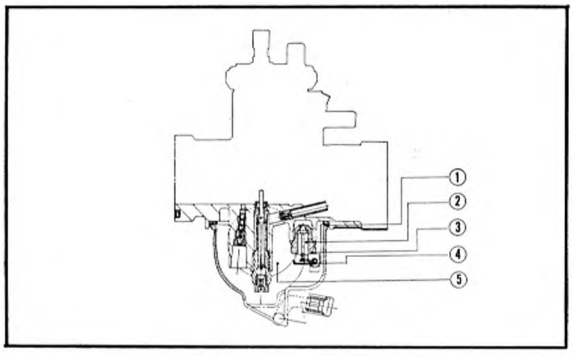


Fig. 3-113. Sectional view of carburetor



① Slow jet
Fig. 3-114. Slow jet



① Float chamber washer ② Float valve
③ Float valve seat ④ Float arm ⑤ Float
Fig. 3-115.

A. Main system (Fig. 3-113)

The fuel passes through the main jet ⑧ and enters the needle jet holder ⑦ where it mixes with the bleed air entering from the bleed hole located around the needle jet holder ⑦. The fuel air mixture passes by the opening between the needle jet ⑤ and jet needle ④ and is discharged from below the throttle valve ③.

It is here that the mixture is combined with the main air and after being atomized, is taken into the engine.

B. Slow system (Fig. 3-113, 3-114)

The air which enters from the inlet passes through the outside of the air screw where it is metered and enters the slow jet bleed hole. It mixes with the fuel which enters the slow jet ① to produce a full spray that is discharged from the pilot outlet at a point under the throttle valve. This mixes with the air from the air inlet to form a combustible mixture before being taken into the engine.

2. FLOAT CHAMBER (Fig. 3-115)

The carburetor must provide a proper mixture of fuel at different throttle openings and engine speeds; in order to accomplish this, the fuel level in the carburetor must be maintained constant. The float chamber functions to serve this purpose. The fuel from the tank enters the float chamber through the fuel inlet passage, between the float valve seat ③ and float valve ② and fills the chamber to the level where the float ⑤ rises to shut off the flow of the fuel by seating the float valve against the valve seat through the action of the float arm ④. As the fuel is consumed, the fuel level in the float chamber, drops the float will follow the level, and the fuel will start to enter the chamber between the opening of the float valve and valve seat to maintain a constant fuel level.

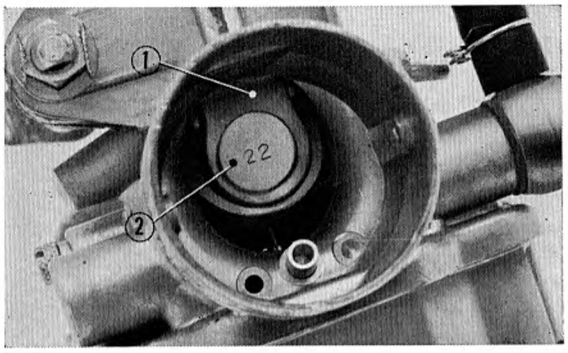
A spring is incorporated in the head of the float valve which comes in contact with the float arm. The purpose of this spring is to prevent the float valve from oscillating so that a constant fuel level can be maintained even when riding over rough or bad roads. It further serves to prevent any shock between the float valve and seat, thereby reducing the amount of wear to these parts.

Overflow pipe

When riding on a steep grade or when any foreign substance becomes lodge in the float valve, it causes the fuel to overflow from the needle jet or the slow jet, and enters the engine causing the engine oil to become diluted. In order to prevent such a condition, an overflow pipe has been incorporated in the float chamber. At normal condition, the pipe opening is above the fuel level and it serves no purpose, but when the overflow condition exists and the fuel level rises, the fuel will drain out of the overflow pipe to the outside rather than into the engine.

3. CHOKE (Fig. 3-116)

For starting in cold weather, a rich fuel mixture is momentarily required; to serve this purpose, a choke valve ① is used in the carburetor. A relief valve ② is included in the choke valve and is held closed by a spring. By raising the choke lever fully, the choke valve closes and the air entering from the air inlet becomes restricted. When the starting motor is engaged with the throttle lever opened approximately 1/4, the fuel will be drawn out of the pilot outlet and the needle jet by the vacuum pressure. At the same time, the vacuum pressure will cause the relief valve to open by the proper amount to provide an ideal fuel mixture to effect and engine start. As the engine starts, the vacuum pressure becomes greater and the relief valve is opened further to provide the proper fuel mixture to warm up the engine. In this manner, the throttle valve movement causes the relief valve to operate and, therefore, the operation of the choke valve is not required to warm up the engine. The choke valve is opened after the engine warms up.



① Choke valve ② Relief valve
Fig. 3-116.

FUNCTION OF THE MAIN COMPONENTS

The main components of the carburetor functions in the following manner.

1. MAIN JET (Fig. 117)

The function of the main jet is to control the fuel discharge and to provide the proper fuel air mixture at the higher range of throttle opening (driving at maximum speed). However, the main jet will also have a varying degree of effect in the vicinity of 1/2 throttle opening. The main jets are numbered, so that the larger the number, bigger the opening and consequently a richer fuel-air mixture.

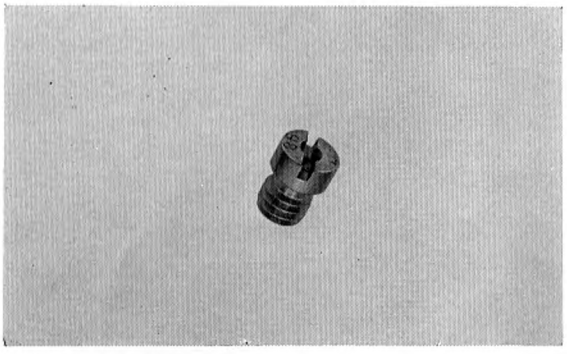


Fig. 3-117. Main jet

2. AIR JET (Fig. 118)

At full throttle opening, the fuel-air mixture has a tendency to become rich, and in order to prevent this condition, a bleed air is added to the fuel through the needle jet holder. The purpose of the air jet is to meter the amount of this air; the larger the air jet, more air will be added to the fuel mixture and a leaner fuel mixture is provided. Also, by mixing the air with the fuel, better atomization will be assured.

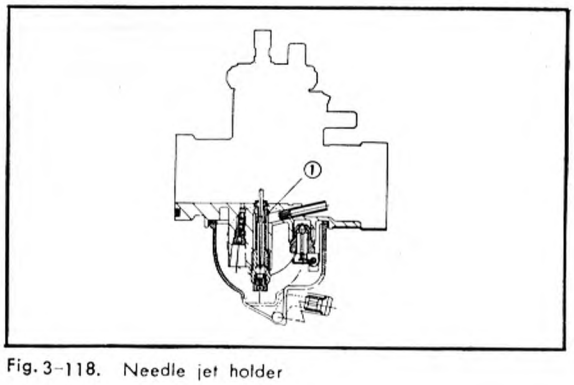


Fig. 3-118. Needle jet holder

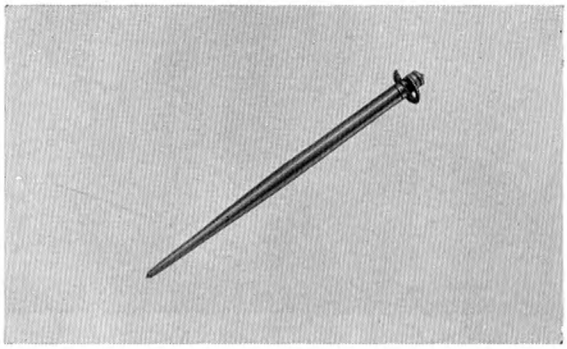
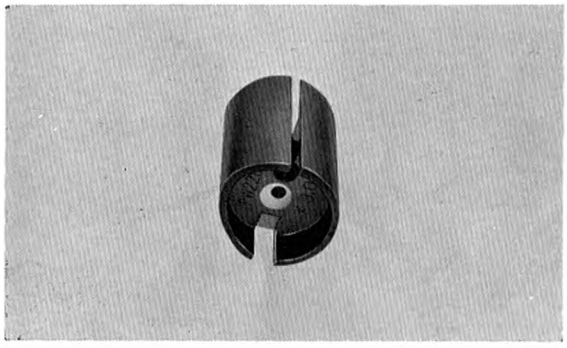


Fig. 3-119. Jet needle



3-120. Throttle valve

3. NEEDLE JET

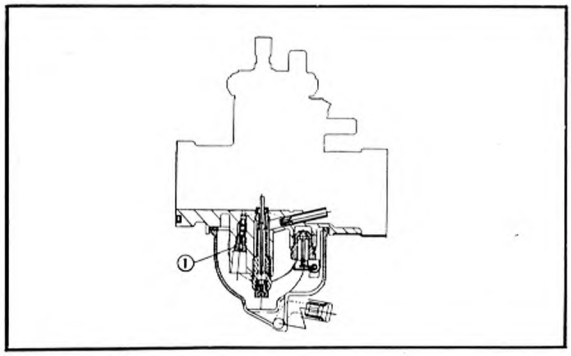
At full or intermediate throttle opening, the needle jet will regulate the fuel which had been metered by the main jet. This control is accomplished together with the jet needle which will be described in the following paragraph. The hole of needle jet is made very accurately for precise control.

4. JET NEEDLE (Fig. 119)

The jet needle together with the needle jet described in the previous paragraph, meters the discharge of the fuel mixture in the 1/4 to 3/4 throttle range. The long tapered needle is suspended within the needle jet opening. The jet needle moves up and down with the throttle to control the fuel mixture proportionally to the throttle opening. There are five grooves on the head of the jet needle by resetting the set clip toward the lower groove, a richer fuel mixture will be provided.

5. THROTTLE VALVE (Fig. 120)

The throttle valve regulates the amount of fuel air mixture taken into the engine to control the output and speed of the engine. In addition, it serves a very important function in that it controls the fuel mixture. There is a cutaway on the throttle valve at the air inlet side which affects the vacuum pressure that controls the function of the needle jet. The use of the throttle valve with different size cutaway will control the discharge rate of the fuel, which affects the fuel-air ratio. The larger throttle valve cutaway number provides leaner mixture, however, this is only effective within the lower range of the throttle opening and has no effect above 1/2 throttle opening. There is also a throttle stop screw which sets the idling speed. Turning this screw IN will raise the idling speed, and lowers the speed when the screw is turned OUT.



① Slow jet
Fig. 3-121. Slow jet

6. SLOW JET (Fig. 121)

The slow jet controls the fuel at slow speed and at idling by regulating the air entering from the air bleed to produce a fuel-air mixture which assists in the atomization of the fuel. The slow jet, like the main jet, provides a richer fuel mixture when a jet of larger number is used.

7. AIR SCREW (Fig. 122)

The air screw regulates the air entering the slow system by controlling the pilot hole. Turning the screw IN will richen the mixture and turning the screw OUT will lean the mixture.

8. FUNCTIONAL RANGE OF THE RESPECTIVE COMPONENTS

In summarizing the description stated above, the functional range of the respective components are as follows:

Air screw :	from full close to 1/8 throttle opening
Throttle valve cutaway :	1/8 to 1/4 throttle opening
Jet needle :	1/4 to 3/4 throttle opening
Main jet :	3/4 to full throttle opening

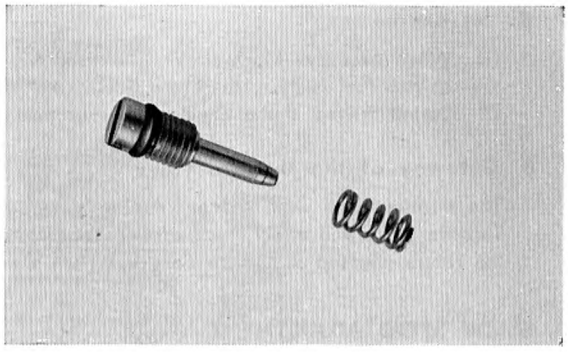
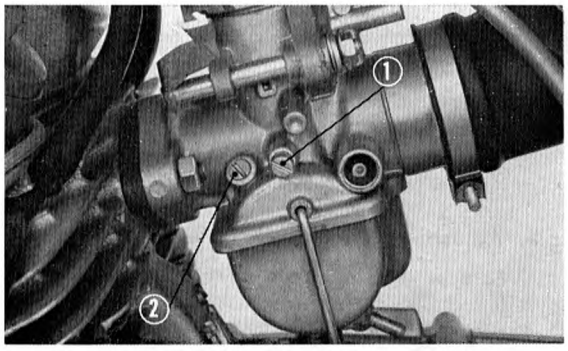


Fig. 3-122. Air screw



① Throttle stop screw ② Air screw
Fig. 3-123. Adjusting carburetor

ADJUSTMENT

1. HIGH SPEED ADJUSTMENT

During driving, if the speed increases when the choke valve is closed slightly, it is an indication that the fuel mixture is lean. In which case, replace the main jet progressively with the next larger size until properly adjusted. The main jet sizes above #100 are #105, #110 and #115 and for sizes below #100 are #98, #95 and #92. In the opposite case, if the speed should fall off when the choke valve is closed, the main jet size is proper, or else, it may be too large. In which case, follow the procedure below to make the determination.

A. Properly set

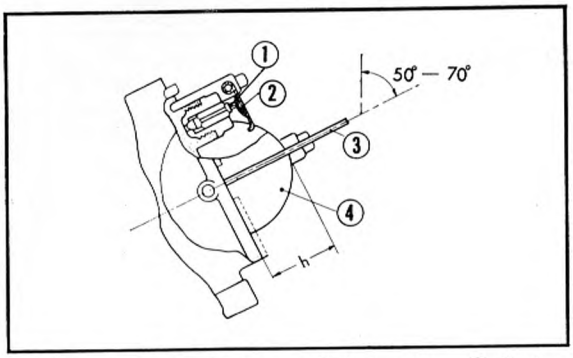
When, after replacing the main jet with one of a smaller size and if it is found to cause a drop in speed, and an increase in speed when the choke is slightly closed, it is an indication that the main jet is too small. The replaced jet can be considered to be of the proper size.

B. Main jet too large

When the jet is too large, progressively replace the jet with one of a smaller size until the condition in paragraph A above occurs, and make the adjustment accordingly.

2. INTERMEDIATE SPEED ADJUSTMENT (Fig. 124)

The adjustment within 1/8 to 3/4 throttle opening is made by the changing the position of the clip on the jet needle groove and the replacement of the throttle valve cutaway. However, the throttle valve cutaway will affect the fuel mixture between idling and 1/4 throttle opening. In the intermediate speed range, it is recommended that the jet needle be adjusted within the range of good acceleration as this will prove to give better fuel economy.



① Float valve ② Float arm ③ Float gauge ④ Float
Fig. 3-124.

A. Jet needle

(1) When excessive black smoke is emitted from the exhaust during intermediate speed, it is an indication of rich fuel mixture, therefore, lower the jet needle by one groove.
(2) During driving, if the engine misses or bucks, raise the jet needle one groove.

B. Cutaway of the throttle valve

The throttle valve with a larger number stamped on the cutaway will give a leaner mixture.
Throttle valve will affect the performance of the slow speed as well as the intermediate speed, therefore, the range affected should be considered when making the adjustment.

3. SLOW SPEED ADJUSTMENT

The fuel mixture adjustment between idling and 1/8 throttle opening is accomplished with the air screw and the cutaway of the throttle valve.

A. Air screw

The mixture adjustment at idle is made by the air screw. Turning the screw clockwise will give a rich mixture and turning in the opposite direction will lean the mixture. Not only is the idling screw used to make the idling adjustment but it also should take into consideration the mixture condition at the point where the throttle starts to open so that there is a smooth transition from the idling speed to the start of throttle opening speed.

B. Adjusting with the throttle cutaway

As a point 1/8 throttle opening, the air screw may no longer be effective in adjusting the fuel mixture. In such a case, replace the cutaway. If the mixture is too rich, replace the cutaway with one of a larger number and if the mixture is too lean, replace with one of a smaller cutaway number.

C. Idle adjustment (Fig. 3-123)

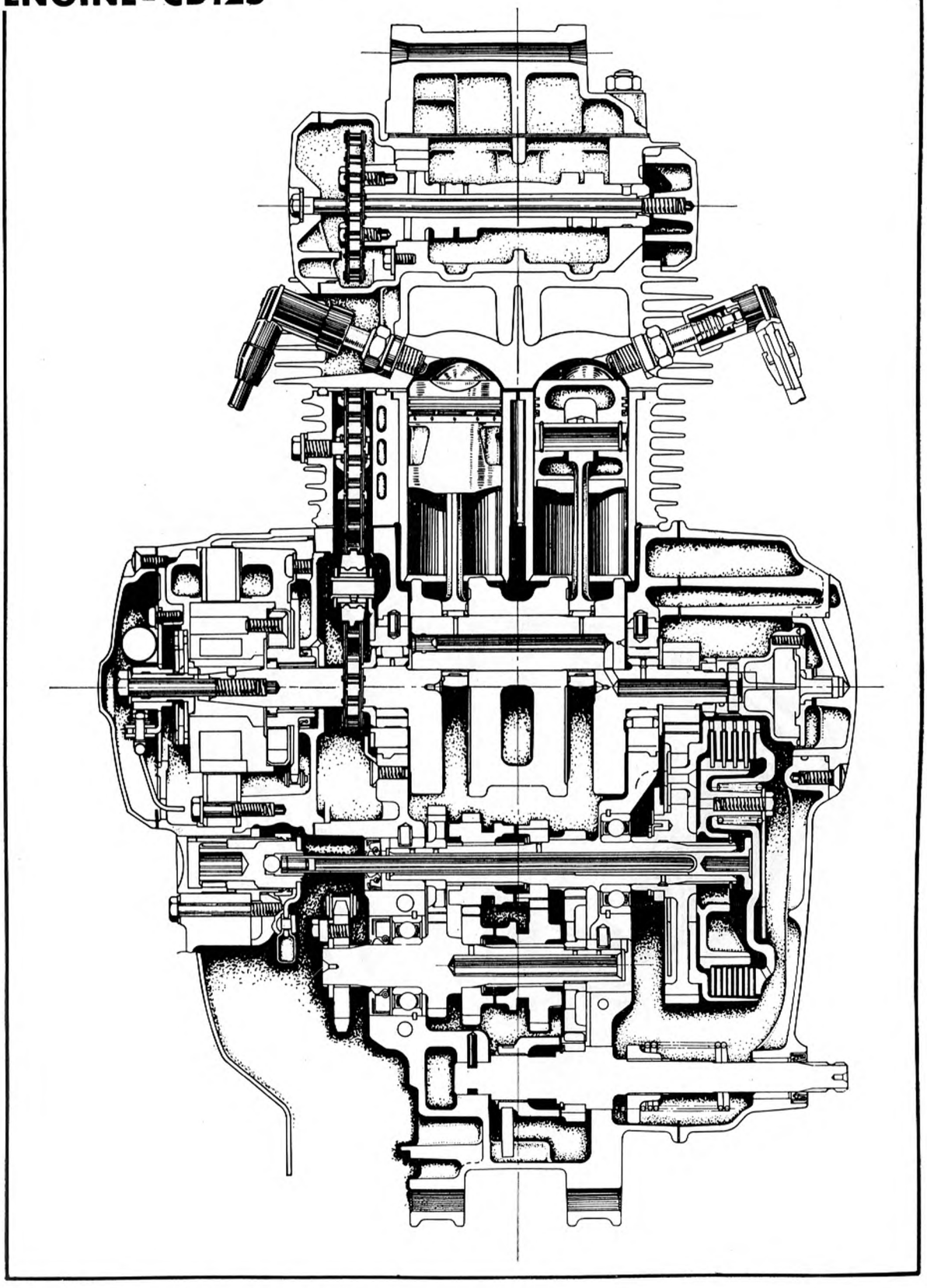
Idle adjustment is made by the use of both the throttle stop screw and the air screw by the following procedure.
(1) Use the throttle stop screw to set the engine to the proper speed.
(2) Manipulate the air screw back and forth slowly to obtain the point of maximum speed.
(3) Reset the throttle stop screw to bring the speed back to the normal.
(4) In this position, recheck the air screw to assure that the setting is correct.
(5) After completing the idle adjustment, check the engine response by snapping and accelerating the throttle. Perform this check between 1/8 to 1/4 throttle opening.

4. FUEL LEVEL ADJUSTMENT (Fig. 3-124)

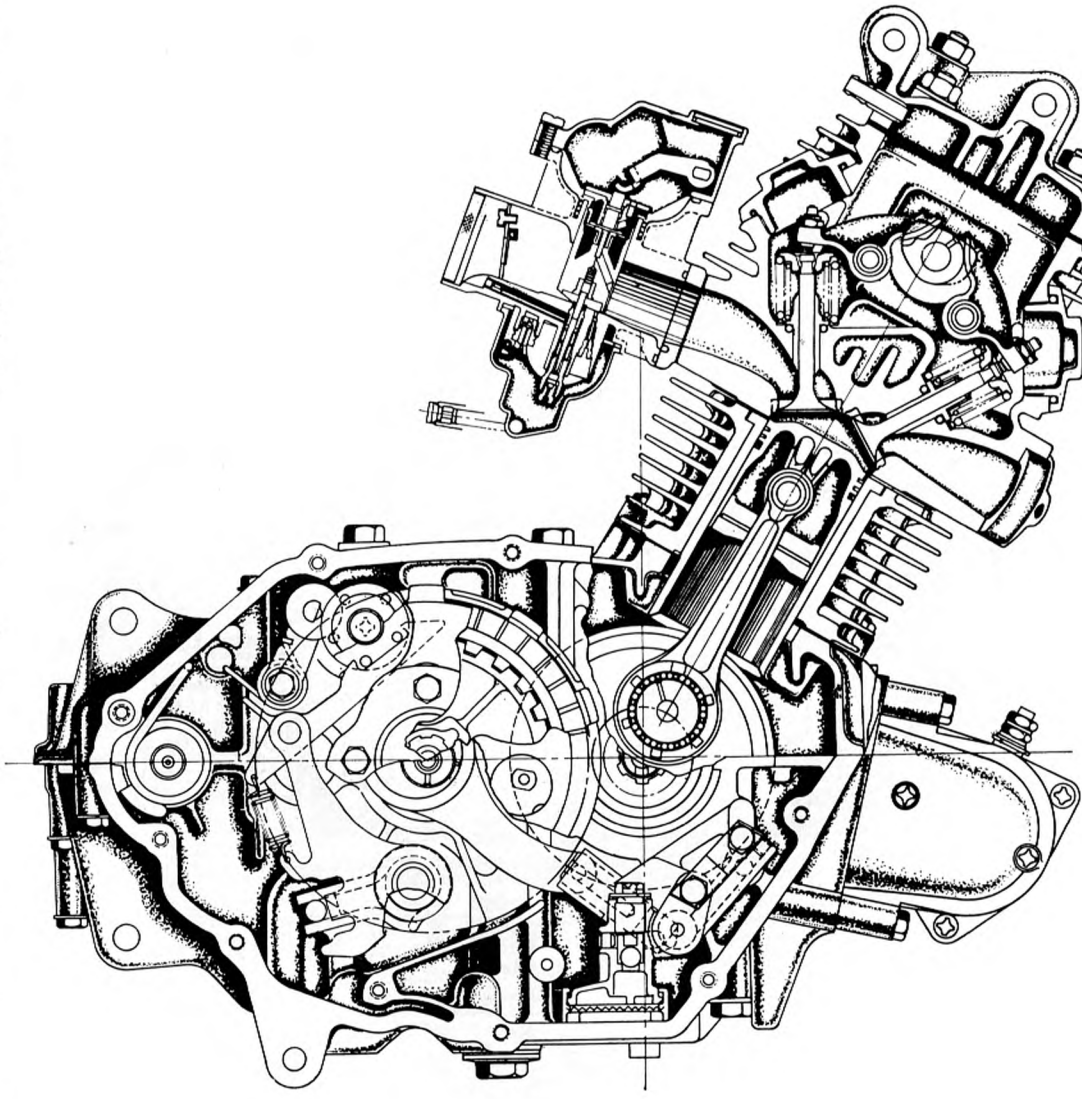
The float level is specified by the height of the float "h" shown in figure 3-124. The float adjusting procedure is described below in conjunction with figure 3-124. h=28.0 mm (1.1 in)

a. Invert the carburetor, in this condition, the weight of the float has caused the float arm to bear against the float valve and the spring is compressed into the valve. This is not the normal fuel level position.
b. Next, set the carburetor as shown in the figure with the float arm pin toward the top, tilt the carburetor so that the float is on the bottom with the float arm in the position so that it is just about to separate from the end of the float valve and set in this position. (the arm will separate from the end of the valve when the carburetor is raised approximately 70°, therefore, about 10° from this point is sufficient, i.e., where the arm is not compressing the valve end).
c. In this position, measure the distance the bottom of the float is from the body flange area with the gauge, this is the height "h". The tolerance is 1 mm, the float may be depressed 1 mm or there may be a clearance of 1 mm between the gauge and the float. This much to lerance will not adver sely affect the operation. If the float is positioned in excess of this amount, make the adjustment by bending the lip of the float arm. There is a spring incorporated in the end of the float valve which will permit the end of the float valve to submerge and will give and erroneous reading, therefore, exercise care when determining the point of contact. Improper measurement and adjustment will not give the proper fuel level.

ENGINE - CD125

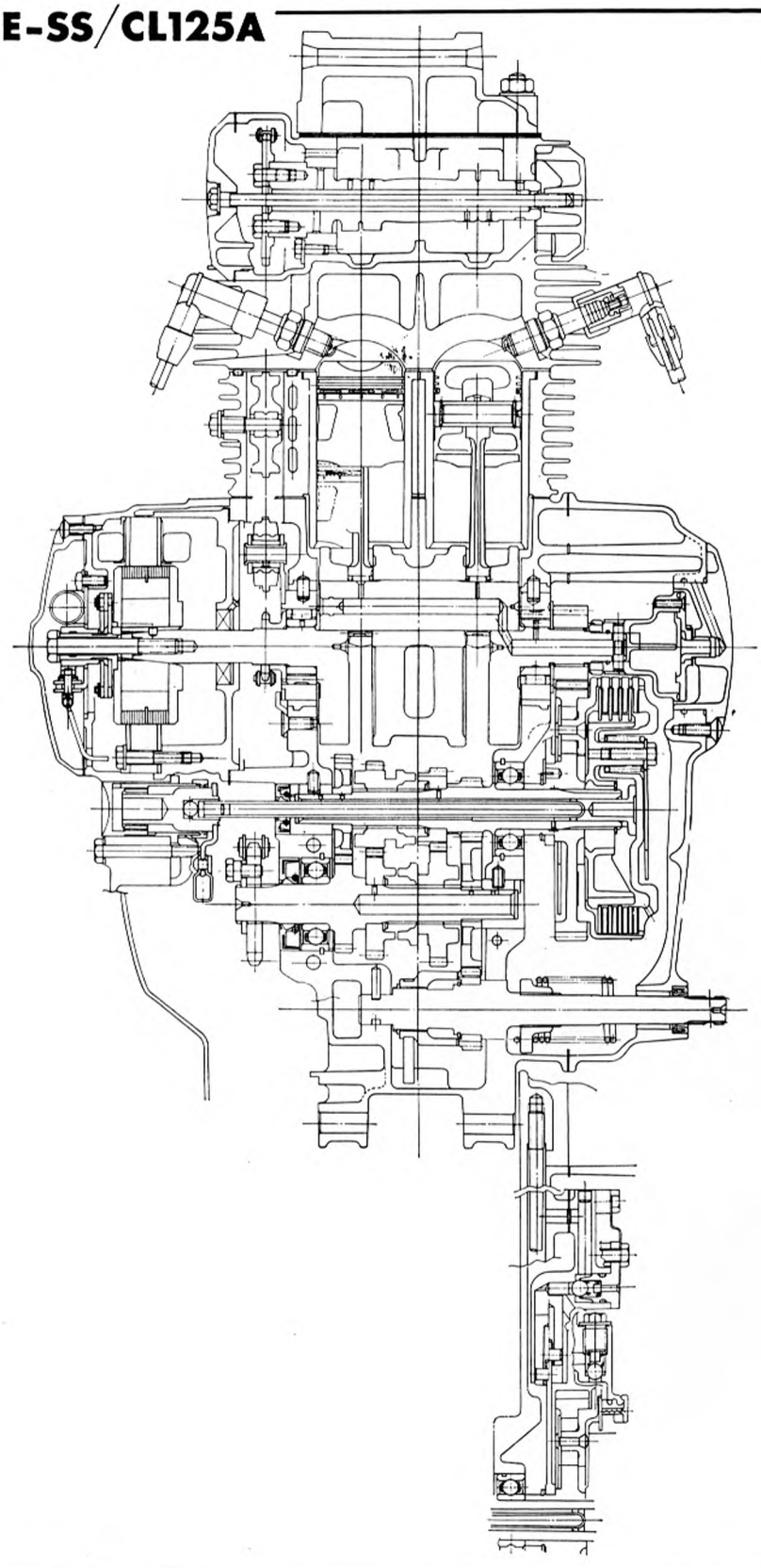


CD125 Engine assembly diagram (Fig. 3–125–1)

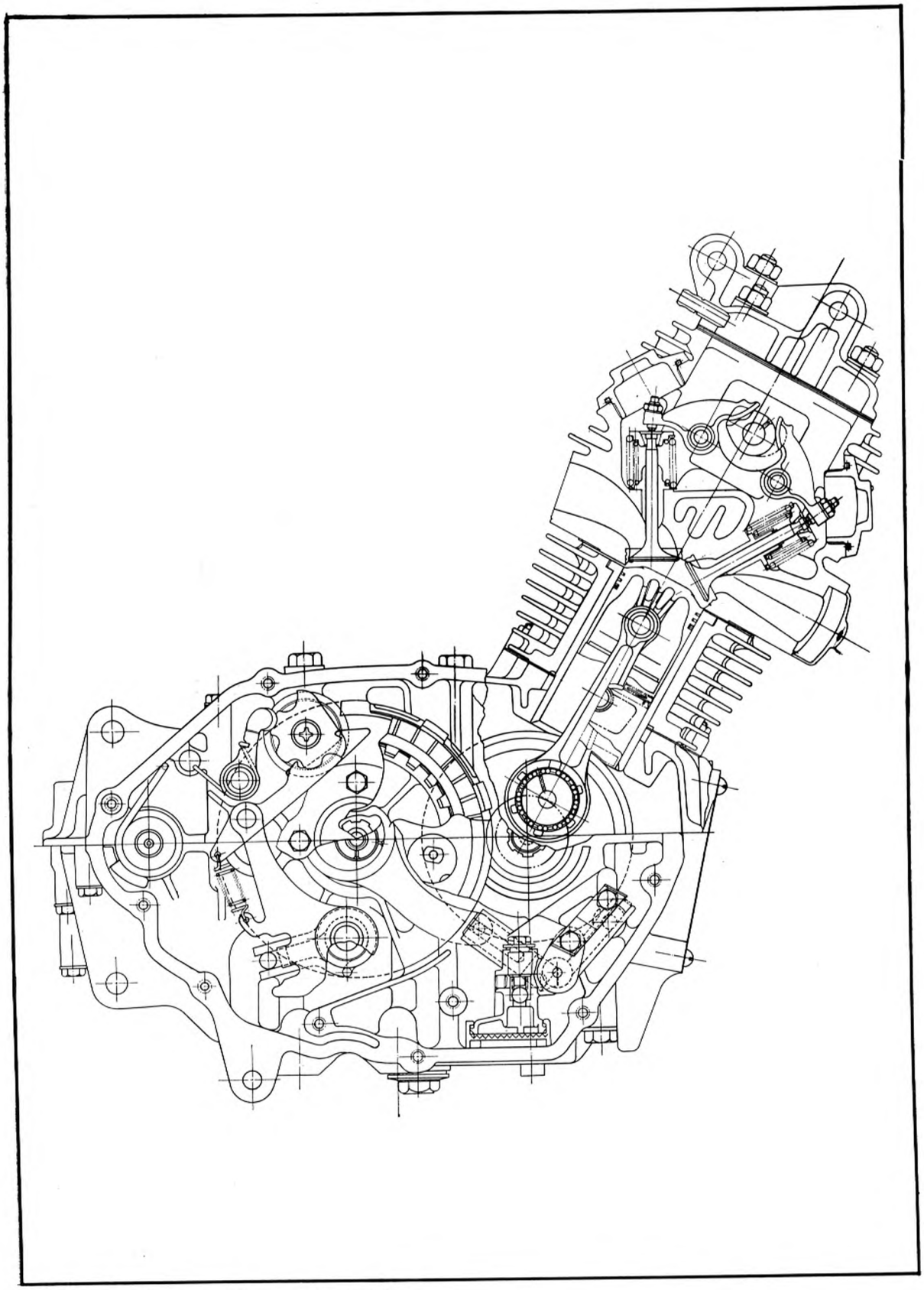


CD125 Engine assembly diagram (Fig. 3–125–2)

ENGINE-SS/CL125A



SS/CL125A Engine assembly diagram (**Fig. 3-126-1**)



SS/CL125 A Engine assembly diagram (Fig. 3–126–2)

The information contained in this section are those areas which are distinct to the CD125A. Those portions which are not described in this section are descriptively identical with the CD175 model and, therefore, the information will be contained in that section.

The CD125 is discussed, in the basic paragraph, however, the CD125A, SS125A and CL125A does not mount a starting motor.

3.1 ENGINE REMOVAL AND INSTALLATION

A. Engine Description

The motorcycle performance characteristics are determined by the engine which is used. Primary requirements of an engine are high power output, light weight, compactness, ability to withstand rough handling and low maintenance cost. Further, the engine must be designed so that it harmonizes with the styling of the frame to give it a well balanced appearance.

All Honda motorcycles are engineered to provide these features.

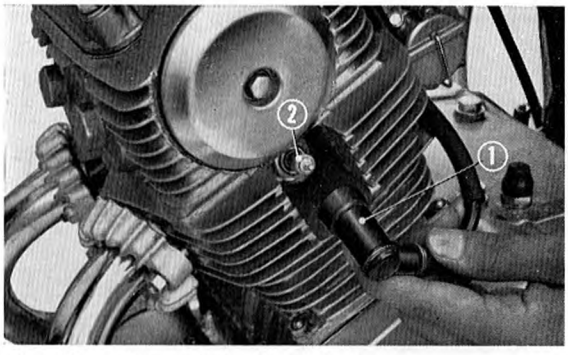
The extensive use of aluminum alloy gives a good weight to power ratio which attributes to high performance. It also provides good engine cooling.

OHC driven by a lightweight chain makes possible higher engine speed, greater power output and quiet operation.

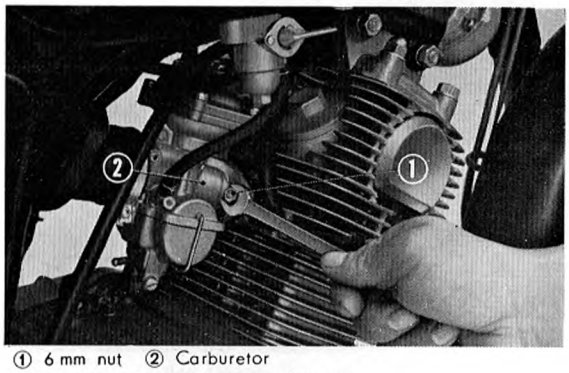
Long life of the engine component and trouble-free maintenance is assured by the employment of dual oil filtering in the pressure lubrication system.

B. Removal

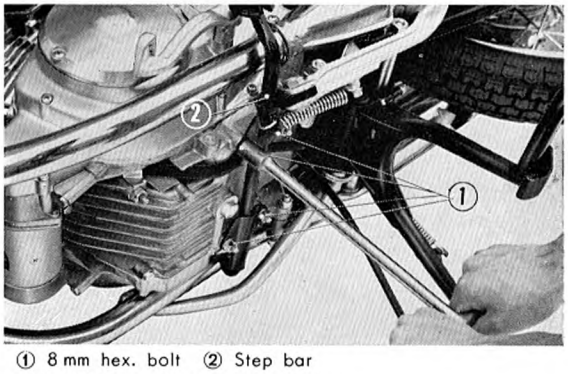
1. Shut off the fuel cock at the tank.
2. Disconnect the high tension terminals ① from the spark plug ② and the primary breaker cord. **(Fig. 3–127)**
3. Disconnect the throttle cable at the carburetor, loosen the air cleaner connecting tube clamp, unscrew the two 6 mm nuts ① mounting the carburetor ② to the cylinder head, and remove the carburetor. **(Fig. 3–128)**
4. Remove the brake pedal spring and the stop light switch spring.
5. Remove the step by unscrewing the four 8 mm bolts ① mounting the step bar ② to the underside of the crankcase. **(Fig. 3–129)**



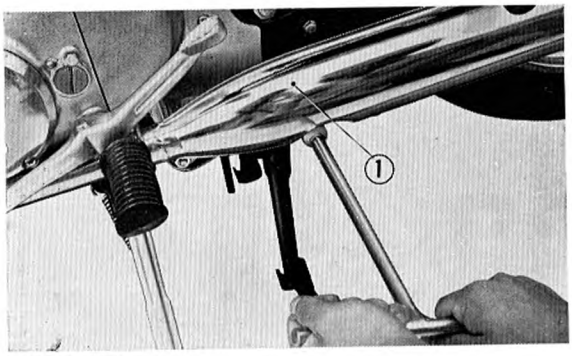
① High tension terminal ② Spark plug
Fig. 3–127. Disconnecting the high tension cord



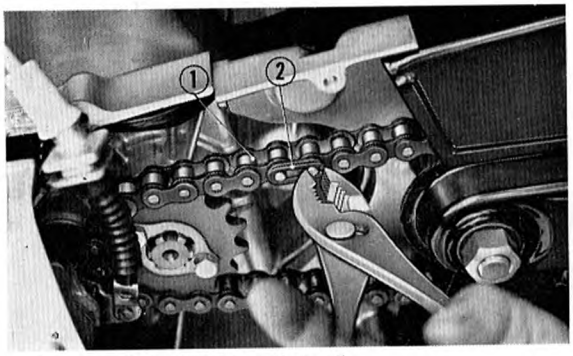
① 6 mm nut ② Carburetor
Fig. 3–128. Removing the carburetor



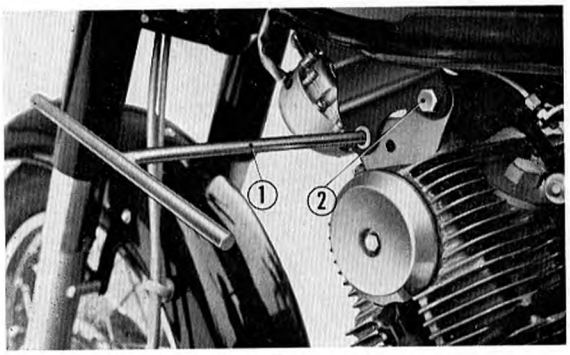
① 8 mm hex. bolt ② Step bar
Fig. 3–129. Removing the step bar



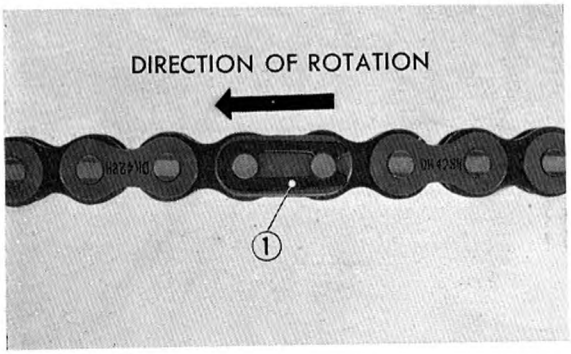
① Muffler
Fig. 3–130. Removing the mufflers



① Drive chain ② Drive chain clip
Fig. 3–131. Disconnecting the drive chain



① T-handle screw driver ② Hanger bolt
Fig. 3–132. Temporary installation



① Joint clip
Fig. 3–133. Joint clip installation

6. Disconnect the starting motor cable at the starter and at the magnetic switch.

   Remove the two starting motor cable clamps (CD125).

7. Remove the 8 mm hex. bolt, the exhaust pipe joints, 10 mm muffler mounting nuts and separate both the right and left mufflers. **(Fig. 3–130)**

8. Unscrew the 6 mm screws, remove the left crankcase rear cover and disconnect the clutch cable lower end from the clutch lifter thread.

9. Rotate the rear wheel to position the chain joint clip ② adjacent to the drive sprocket and disconnect the drive chain ①. **(Fig. 3–131)**

   When disconnecting the chain, attach a piece of wire to both ends of the chain to prevent the chain from coiling up in the chain case, thus facilitating the task of reinstalling the chain.

10. Unscrew the four engine mounting nuts, place a support block under the engine to prevent dropping and then push out the mounting bolts. The engine will be freed from the frame.

C. Installation

1. Perform the engine installation in the reverse order of removal described in Section 3.1 A.

2. The engine installation can be made easier by temporarily hanging the engine on the frame by the use of the T-handle cross screwdriver followed by the installation of the engine mounting bolts. **(Fig. 3–132)**

(Note)

When reconnecting the drive chain, the joint clip should be installed with the opening facing opposite to the direction of the normal drive chain movement. **(Fig. 3–133)**

3. Adjust the chain tension so that there will be 1 to 2 cm (0.40–0.80 in) slack in the chain.

3.2 CYLINDER HEAD AND CYLINDER

1. CYLINDER HEAD, COVER AND BREATHER

A. Construction

The cylinder head is a cast aluminum twin head construction of a semi-spherical combustion chamber with a squish area for better combustion efficiency.

The single piece overhead camshaft, rocker arms and valve mechanisms are all incorporated in the valve chamber above the combustion chamber. **(Fig. 3–134)**

Cylinder head cover incorporates a breather passage for dissipating the pressure build up.

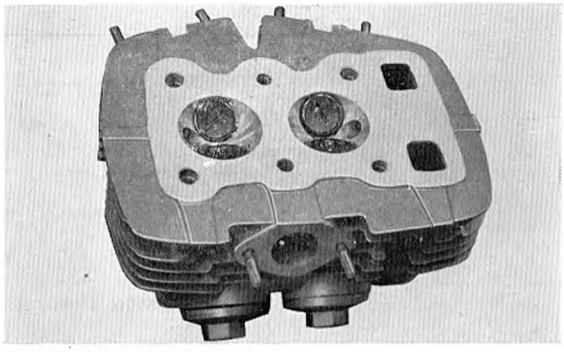
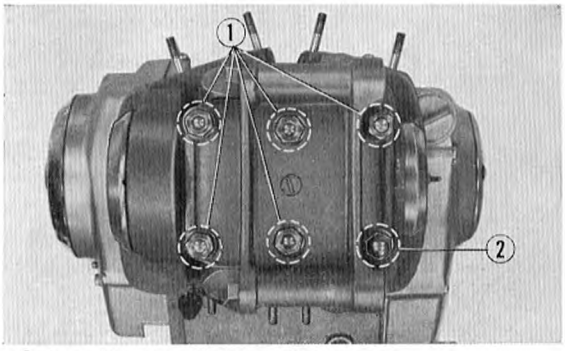


Fig. 3–134. Cylinder head

B. Disassembly

1. Drain oil from the engine.
2. Remove the 8 mm blind nut and five 8 mm hex. nuts, and then remove the cylinder head cover. **(Fig. 3–135)**
3. Remove the left and right cylinder head side covers by unscrewing the long bolt from the left side.
4. Rotate the crankshaft so that the cam chain joint is toward the top of the cam sprocket and then remove the cam sprocket mounting bolts.
5. Attach a wire ① to both ends of the chain ② before disconnecting the cam chain. This will simplify the reassembly task later. **(Fig. 3–136)**
6. Separate the cylinder head from the cylinder.

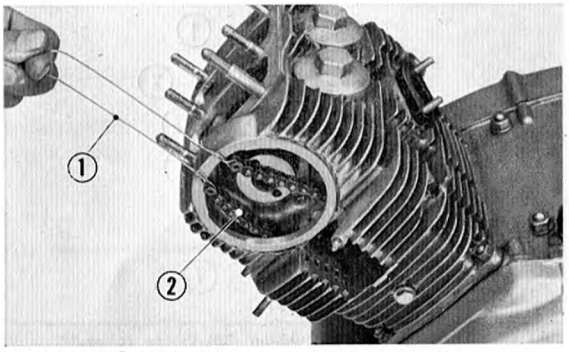


① 8 mm hex. nut ② 8 mm blind nut

Fig. 3–135. Removing the cylinder head cover

C. Inspection

1. Disassemble and clean all the parts before inspection. Carbon should be removed with a carbon scraper to prevent damaging the head. **(Fig. 3–137)**
2. Refer to Section 3.2 on page 25.
3. Inspect the combustion chamber, inlet and exhaust ports for cracks.
4. Inspect the valve guide and valve stem. Check the valve guide diameter at the top, center and bottom in both the X and Y axes, using a precision cylinder gauge. Check the valve stem with micrometer.



① Wire ② Cam chain

Fig. 3–136. Attaching the wire to the cam chain

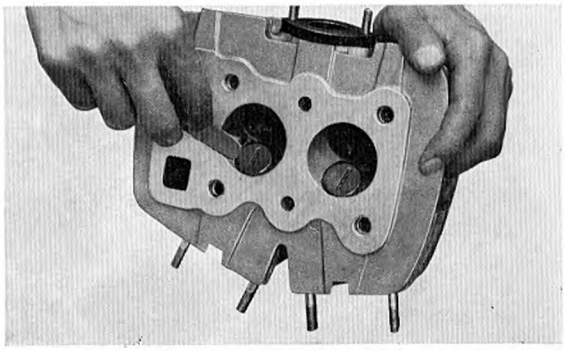
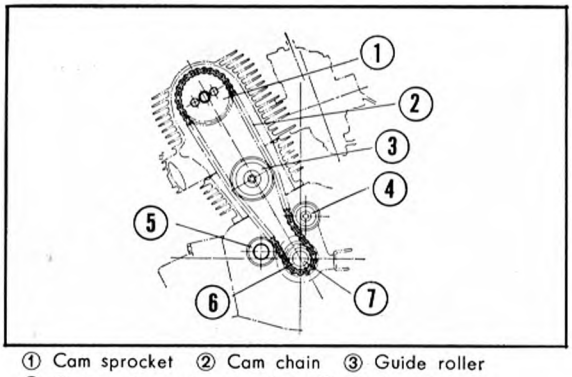


Fig. 3–137. Scraping carbon on combustion chamber

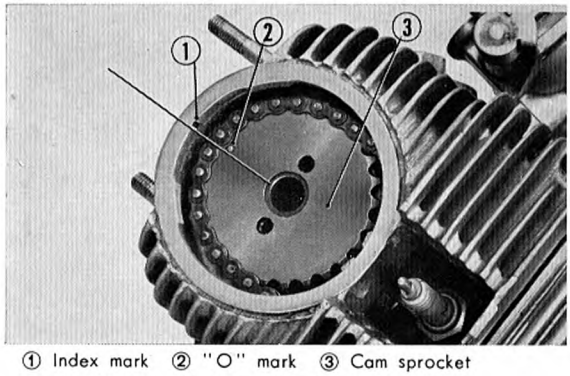
	Item	Standard Value	Serviceable Limit
Inlet valve	Outside diameter	5.48~5.49 mm (0.2158~0.2162 in)	Replace if under 5.46 mm (0.215 in)
	Contact face runout	Within 0.02 mm (0.0008 in)	
Inlet valve guide	Inside diameter •	5.5~5.515 mm (0.2165~0.2171 in)	Replace if over 5.555 mm (0.219 in)
	Outside diameter •	10.055~10.065 mm (0.3959~0.3963 in)	
	Interference fit •	0.04~0.065 mm (0.0016~0.0026 in)	
	Inlet valve clearance	0.01~0.035 mm (0.0004~0.0014 in)	Replace if over 0.08 mm (0.028 in)
Exhaust valve	Outside diameter	5.46~5.47 mm (0.2150~0.2154 in)	Replace if under 5.44 mm (0.214 in)
	Contact face runout	Within 0.02 mm (0.0008 in)	
Exhaust valve guide	Inside diameter •	5.5~5.515 mm (0.2165~0.2171 in)	Replace if over 5.555 mm (0.219 in)
	Outside diameter •	10.055~10.065 mm (0.3959~0.3963 in)	
	Interference fit •	0.04~0.065 mm (0.0016~0.0026 in)	
	Exhaust valve clearance	0.03~0.055 mm (0.0012~0.0022 in)	Replace if over 0.1 mm (0.0039 in)

If the valve guide is beyond serviceable limit, it may be repaired by using a reamer (Tool No. 07008-24301 for SS125A/CL125A and 07008-24001 for CD125/CD125A.) and replacing the valve with one of an oversize.

5. When replacement of the valve guide becomes necessary, remove and replace with an oversize guide ; use the valve guide remover (Tool No. 07047-04001) and the valve guide driver (Tool No. 07046-21601) for replacement operation. After installing the valve guide, use a reamer to obtain the proper valve clearance.



① Cam sprocket ② Cam chain ③ Guide roller
④ Cam chain tensioner roller ⑤ Guide roller
⑥ Timing sprocket ⑦ Crankshaft
Fig. 3-138.



① Index mark ② "O" mark ③ Cam sprocket
Fig. 3-139. Installing the cam sprocket

D. Reassembly

1. Reassemble the cylinder head in the reverse order of disassembly.

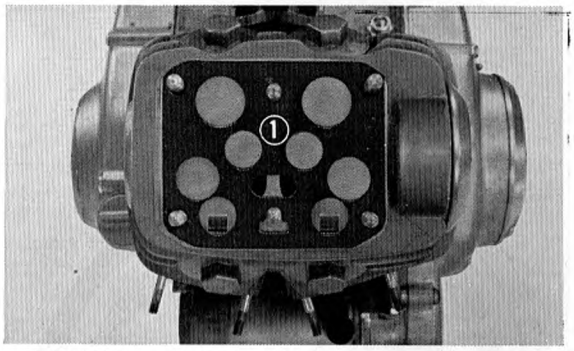
(Note)

(1) Before installing the cam chain, the valve must be timed in reference to the position of the crankshaft. To do this, first, position the crankshaft so that the knock pin at the tapered shaft end is on the cylinder centerline and toward the cylinder head. Then align the "O" mark stamped on the cam sprocket to the index mark on the cylinder head (both inlet and exhaust valve should be closed, if not, rotate the cam shaft 180°). In this position, connect the cam chain. **(Fig. 3-138, 139)**

(b) Check the condition of the gaskets. It is recommended that a new gaskets be used throughout, especially the head gasket. **(Fig. 3–140)**

(c) If the cam chain tensioner push rod is not screwed in completely, the cam chain cannot be connected.

2. Tighten the cylinder head cover nuts uniformly in the sequence shown.
   Torque (CD125A) :
   180–230 kg·cm (13.0–16.7 ft·lbs)
   Torque (SS125A, CL125A) :
   160–190 kg·cm (11.6–13.8 ft·lbs)
   (Fig. 3–141)
3. Insert the bolt in through the center bolt hole on the left side cover, assemble and tighten the right side cover.



① Cylinder head cover gasket
Fig. 3–140.

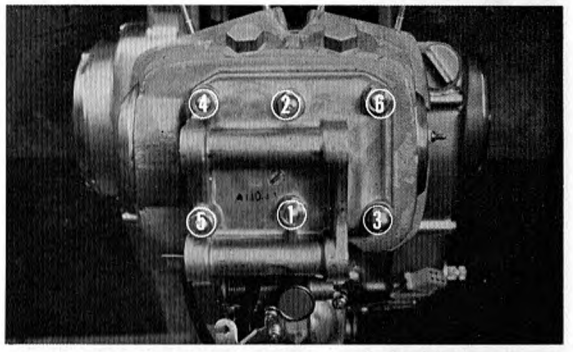
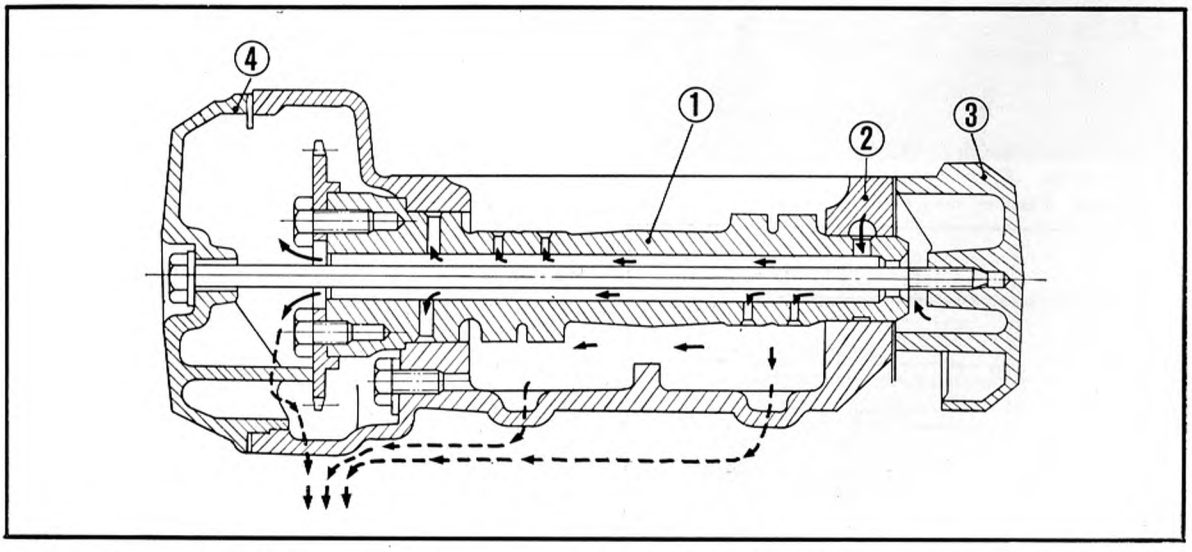


Fig. 3–141. Torquing sequence of cylinder head

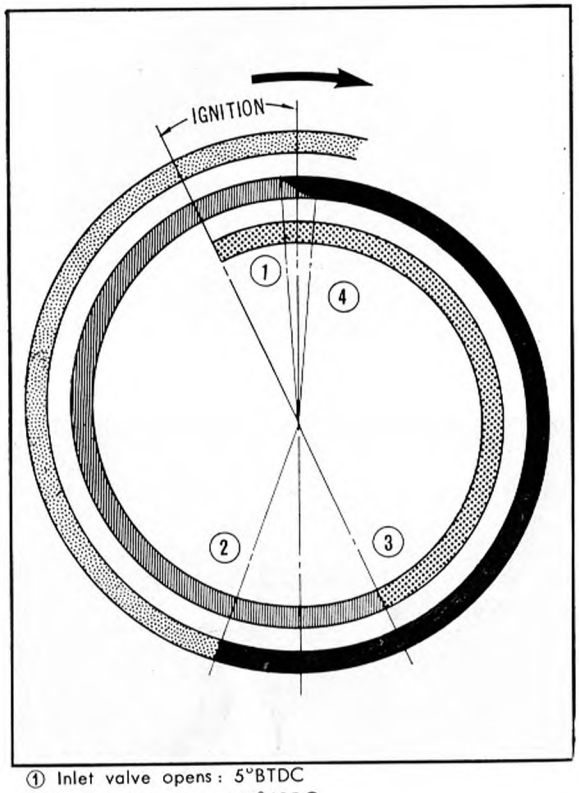
2. CAMSHAFT

A. Construction

A single piece camshaft contains both inlet and exhaust cams together with the sprocket which is mounted at the left end. **(Fig. 3–142)**
The cam sprocket is driven by the crankshaft at 1/2 the speed.
The cam is designed with a long gradual slope to prevent abrupt rise and drop of the valve, thus assuring a quieter valve operation.

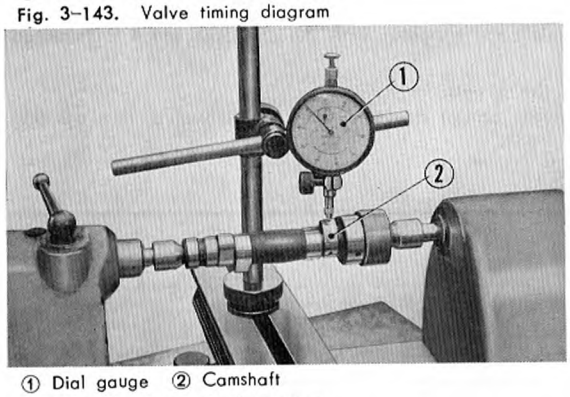


① Camshaft ② Cylinder head ③ Cylinder head right side cover ④ Cylinder head left side cover
Fig. 3–142. Oil passage diagram



① Inlet valve opens : 5°BTDC
② Inlet valve closes : 20°ABDC
③ Exhaust valve opens : 25°BBDC
④ Exhaust valve closes : 5°ATDC

Fig. 3–143. Valve timing diagram



① Dial gauge ② Camshaft

Fig. 3–144. Camshaft dimensions

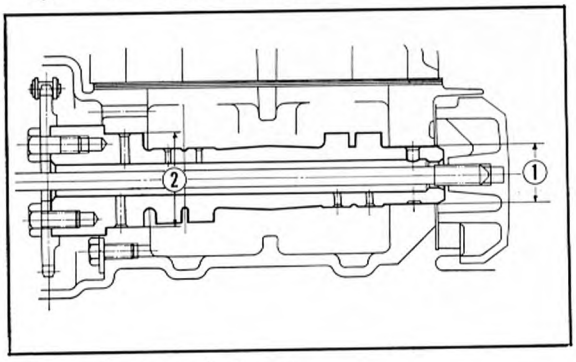


Fig. 3–145. Camshaft dimensions

B. Disassembly

1. Remove the cylinder head in accordance with Section 3.2.1 B.
2. Remove the tappet adjusting hole caps and loosen the tappet adjusting screws.
3. Remove the 5×12 hex. bolt holding the rocker arm shaft stopper and pull out the rocker arm shafts, the rocker arms can be removed from the cylinder head.
4. Remove the camshaft from the head by sliding out the left side (valves should all be in the closed position).

C. Inspection

1. Valve timing **(Fig. 3–143)**
2. Check the cam for excessive wear or scoring.

3. Camshaft **(Fig. 3–144, 145)**

Item		Standard Value	Serviceable Limit
Right end diameter ①		19.953～19.964 mm (0.7857～0.7861 in)	Replace if under 19.93mm (0.7846in)
Left end diameter ②		32.927～32.94 mm (1.2963～1.2968 in)	Replace if under 32.907mm(1.2955in)
Cam base circle		21.0 mm (0.8268 in)	
Cam height	IN	26.177mm(1.0306in)	
	EX	25.740mm(0.0134in)	

4. Cam sprocket root diameter

   Standard value ⇨ 59.87～59.99 mm
   (2.358～1.364 in)

D. Reassembly

1. Assemble the camshaft into the cylinder head in the reverse order of disassembly.
2. Adjust the tappet clearance to 0.05 (0.002 in) with a cold engine.

3. ROCKER ARM

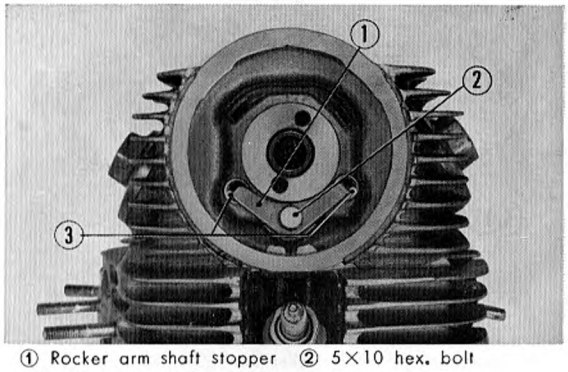
A. Construction

The function of the rocker arm is to transpose the rotary motion of the camshaft to a reciprocating motion for actuating the valve. The rocker arm is made rigid to prevent deflection and the end which contacts the cam is finished smooth after surface hardened to minimize wear. The end which operates the valve is provided with a tappet adjusting screw that contacts the valve.

B. Disassembly

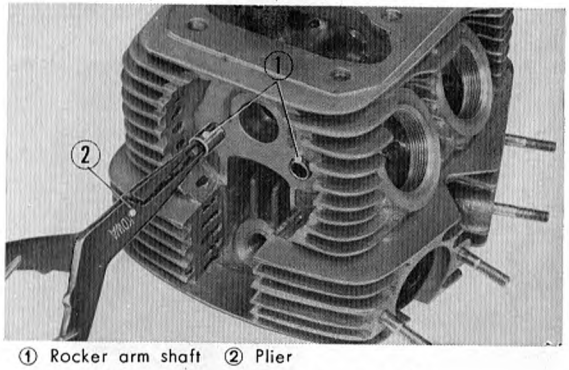
1. Disassemble the cylinder head in accordance with Section 3.2. 1. B.
2. Loosen the tappet adjusting screws.
3. Rotate the camshaft so that the rocker arms are resting on the base circle of the cam (this can be set by aligning the "O" mark stamped on the cam sprocket to the index mark on the cylinder head left cover flange).
4. Remove the bolt holding the rocker arm shaft stopper ① and pull out the rocker arm shafts; ③ the rocker arms can then be removed. **(Fig. 3–146)**

   To facilitate the removal, use the snap ring plier. **(Fig. 3–147)**



① Rocker arm shaft stopper ② 5×10 hex. bolt
③ Rocker arm shafts

Fig. 3–146. Removing the rocker arm shafts



① Rocker arm shaft ② Plier

Fig. 3–147. Removing the rocker arm shaft

C. Inspection

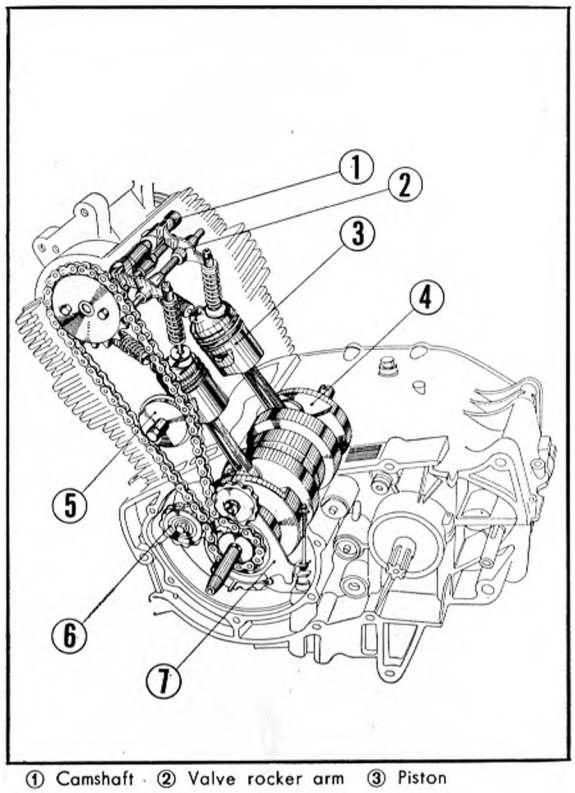
1. Clean all parts, especially make sure that the oil holes are clean.
2. Inspect the rocker arm cam contact surface and repair or replace if there is scoring or excessive wear.

Rocker arm

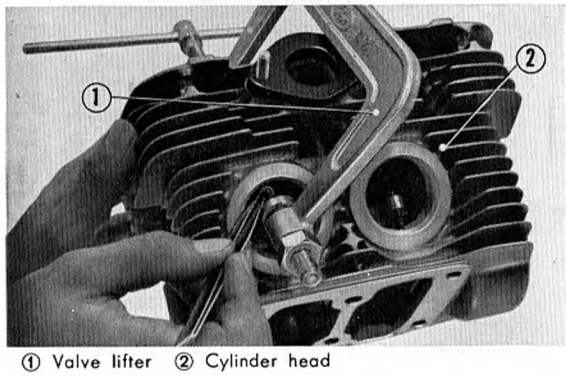
Item	Standard Value	Serviceable Limit
Slipper surface wear	——	Replace if over 0.3 mm (0.012 in)
Shaft bore diameter	10.00~10.015 mm (0.3937~0.3943in)	Replace if over 10.1 mm (0.40 in)

Rocker arm shaft

Item	Standard Value	Serviceable Limit
Outside diameter	9.972~9.987 mm (0.3926~0.3933 in)	Replace if under 9.92 mm (0.3934 in)
Clearance	0.013~0.043 mm (0.0005~0.0017 in)	Replace if over 0.08 mm (0.0031 in)



① Camshaft ② Valve rocker arm ③ Piston
④ Crankshaft ⑤ Cam chain guide roller
⑥ Camchain tensioner roller ⑦ Cam chain tensioner
Fig. 3–148. Valve mechanism



① Valve lifter ② Cylinder head
Fig. 3–149. Removing the valves

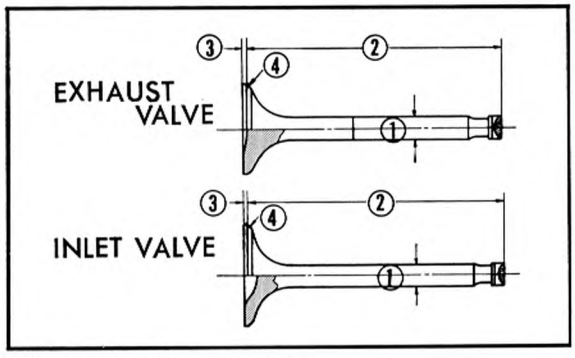


Fig. 3–150. Valve dimensions

3. Check for proper tappet clearance, both inlet and exhaust should be 0.05 mm (0.002 in), too small a clearance will cause the valves to remain partly open, causing compression leak and results in hard starting.

D. Reassembly

Reassemble the valve rocker arm in the reverse order of disassembly.

4. VALVE

A. Construction

Refer to Section 3.2.5 on page 31.

B. Disassembly

1. Remove the cylinder head. Refer to Section 3.2. 1 A. on page 72.
2. Disassemble the rocker arms and camshaft from the cylinder head. Refer to Section 3.4.B. on page 75 and 76.
3. Compress the valve spring with the valve lifter (Tool No. 07031–21601) and after removing the valve cotters, valve springs, retainers, the valves can be removed. **(Fig. 3–149)**

C. Inspection

1. Exhaust valve **(Fig. 3–150)**

Item	Standard Value	Serviceable Limit
Stem diameter ①	5.46~5.47 mm (0.2150~0.2154 in)	Replace if under 5.44 mm (0.2142 in)
Length ②	61.6~61.8 mm (2.4252~2.4331 in)	Replace if under 61.2 mm (2.4094 in)
Head thickness ③	0.6~0.8 mm (0.024~0.032 in)	Replace if under 0.3 mm (0.0118 in)
Concentricity of valve face ④	With in 0.02 mm (0.0008 in)	

Inlet valve **(Fig. 3–150)**

Item	Standard Value	Serviceable Limit
Stem diameter ①	5.48~5.49 mm (0.1764~0.1768 in)	Replace if under 5.46 mm (0.2150 in)
Length ②	62.2~62.4 mm (2.4488~2.4567 in)	Replace if under 61.8 mm (2.4331 in)
Head thickness ③	0.4~0.6 mm (0.0158~0.0236 in)	Replace if under 0.2 mm (0.0079 in)
Concentricity of valve face ④	Within 0.02 mm (0.0008 in)	

2. Valve spring measurement **(Fig. 3–151)**

Outer valve spring

Item	Standard Value	Serviceable Limit
Free length	32.1 mm (1.2638 in)	Replace if under 31.0 mm (1.2205 in)
Pressure	20.3 mm/19~21 kg (0.799 in/41.895~46.305 lbs)	——

Inner valve spring

Item	Standard Value	Serviceable Limit
Free length	26.1 mm (1.0276 in)	Replace if under 25.6 mm (1.0079 in)
Pressure	15.6 mm/10.45~11.55 kg (0.6142in/23.042~25.468 lbs)	——

D. Reassembly

1. Install the outer and inner valve springs from the tappet adjusting hole and compress the springs with a valve lifter and reassemble the valves with a valve cotters.

5. VALVE SEAT

A. Description

The valve seat is repaired with three types of cutter.

The relative location and the width of the valve seat contact area is accomplished with the valve seat surface cutter and seat interior cutters while the refacing of the valve contact area is performed by the 90° cutter. **(Fig. 3-152)**

Valve lapping operation is performed last, this is to obtain a leak-proof seal between the valve and the valve seat. Place a liberal amount of lapping compound on the valve face and lap the valves, applying a slight pressure while rotating the valve back and forth with a suction cup lapping tool. Wash off the compound thoroughly and inspect the valve seat with bluing.

(Note)

(a) When the valve stem is greatly worn, the valve guide is usually also worn. Hence, when a valve is replaced, it also is desirable to replace the valve guide. Since the guide is press fitted, it is recommended that they be replaced with an oversize guide.

(b) Before the valve is assembled, the compound which was used during lapping should be completely removed.

6. CYLINDER

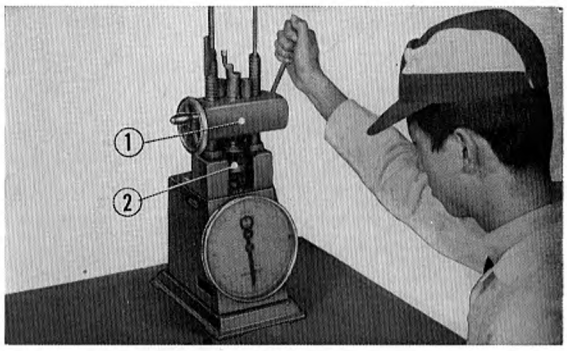
A. Construction

For improved cooling effect and weight reduction, the cylinder is made of aluminum alloy with the cylinder sleeves of the special cast steel force fitted. **(Fig. 3-153)**

The cam chain tensioner guide roller is incorporated on the left hand side of the cylinder.

B. Disassembly

1. Remove the cylinder head. Refer to Section 3.2 B.
2. Remove the two 6 mm hex. nuts and the cylinder from the crankcase. **(Fig. 3-154)**



① Valve spring tester ② Valve spring

Fig. 3-151. Measuring valve spring tension

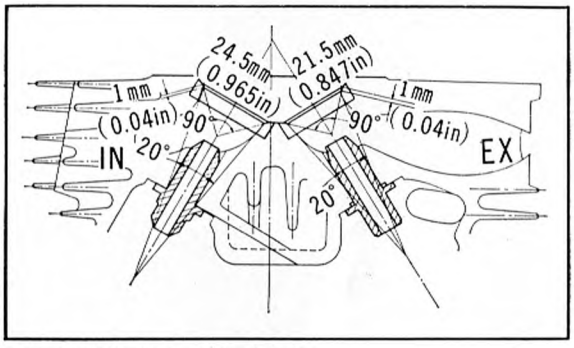


Fig. 3-152. Valve seat detail

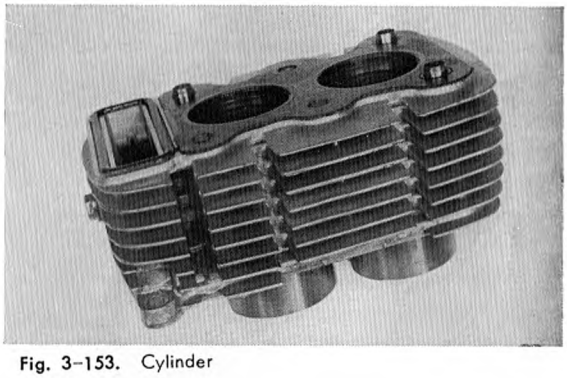
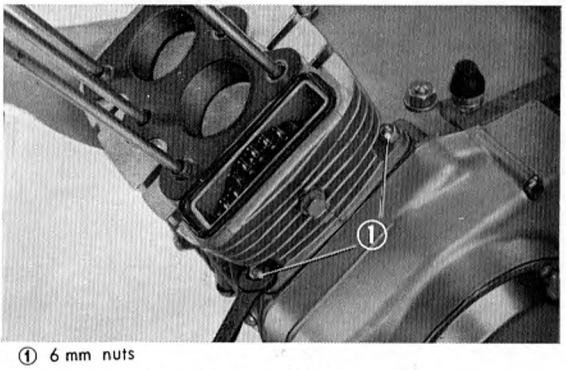
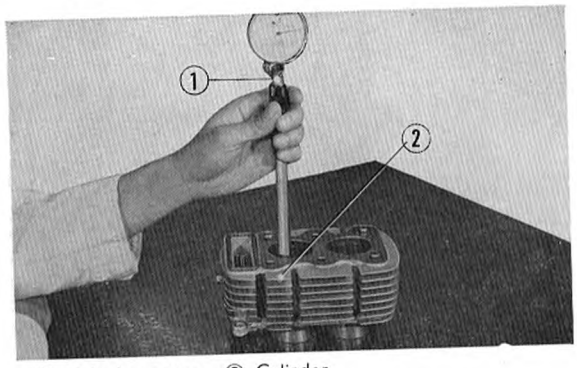


Fig. 3-153. Cylinder

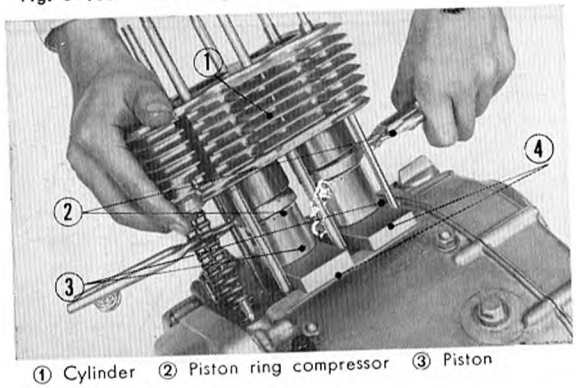


① 6 mm nuts

Fig. 3-154. Removing the cylinder



① Cylinder gauge ② Cylinder
Fig. 3–155. Measuring the cylinder bore



① Cylinder ② Piston ring compressor ③ Piston
④ Piston base
Fig. 3–156. Installing the cylinder

C. Inspection

1. Measure the cylinder bore, taper, and out-of-round with a precision cylinder gauge. **(Fig. 3–155)** Take the measurement at the top, middle and bottom in both the X and Y axes.

Item	Standard Value	Serviceable Limit
Bore	44.0~44.01 mm (1.7323~1.7327 in)	Repair if over 44.1 mm (1.7362 in)
Taper, out-of-round	0.005 mm (0.0002 in)	Repair if over 0.05 mm (0.0020 in)

2. The clearance between the piston and cylinder will greatly affect the engine performance. Because the piston is elliptical, the clearance is controlled very closely. The clearances are not the same, however, if any area is greater than 0.1 mm (0.004 in), the cylinder should be rebored and fitted with an oversize piston.

D. Reassembly

1. Install the gasket between the cylinder and crankcase and insert the cylinder over the stud bolts.
2. Make sure that the cylinder gasket and the two dowel pins are installed.
3. During the installation of the cylinder, use a hardwood piston base to prevent piston movement. Also use a ring compressor to prevent ring damages. **(Fig. 3–156)**

3.3 LEFT CRANKCASE COVER

1. LEFT CRANKCASE COVER

The purpose of the crankcase cover is to protect the vital components parts of the engine. The contact breaker is mounted on the left crankcase cover.

2. A.C. GENERATOR

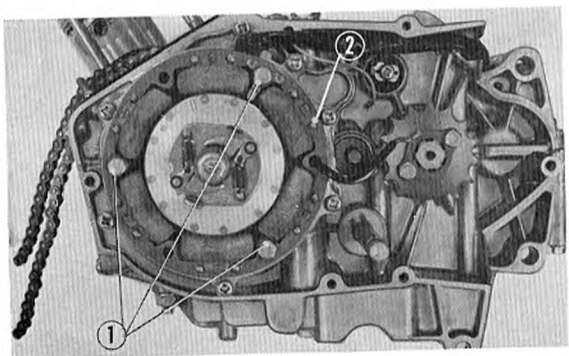
A. Construction

The detailed description of the A.C. generator is given in the electrical section on page 132.

B. Disassembly

A.C. generator can be disassembled or reassembled without separating the engine from the frame. However, this section describes disassembly of the A.C. generator from the engine which had been separated from the frame, and the cylinder and cylinder head have been disassembled.

1. Remove three screws and take off the contact breaker cover.
2. Disconnect the primary lead from the breaker assembly terminal and remove the two contact breaker plate screws to remove the breaker assembly.
3. Remove the left crankcase cover.
4. Prevent the piston from damage by using the piston bases.
5. Remove the three bolts holding the A.C. generator stator and A.C. generator stator can be separated. **(Fig. 3–157)**



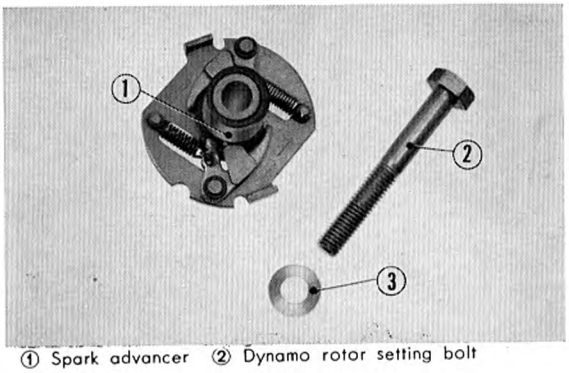
① 6 mm hex. bolt ② Stator
Fig. 3–157. Removing the dynamo stator

6. Remove the bolts holding the A.C. generator rotor and the spark advancer assembly can be removed. **(Fig. 3–158)**
7. Remove the rotor from the crankshaft using the A.C. generator rotor puller. (Tool No. 07011–20001) **(Fig. 3–159)**

C. Reassembly

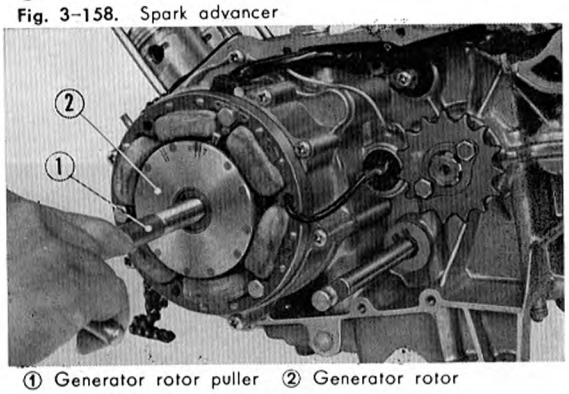
1. Align the dowel pin on the crankshaft when reassembling the A.C. generator rotor, set in the crankshaft with the groove on the rotor and insert the rotor. Install the spark advancer over the rotor and tighten the rotor setting bolt.

   Torque : 160–210 kg·cm (11.6–15.2 ft·lbs)
2. Reassemble the crankcase cover, etc. in the reverse order of disassembly.



① Spark advancer ② Dynamo rotor setting bolt ③ Washer

Fig. 3–158. Spark advancer



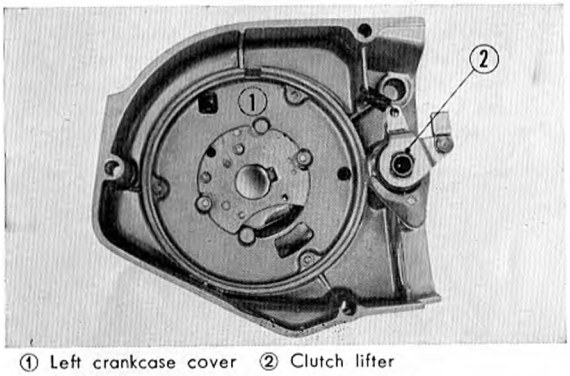
① Generator rotor puller ② Generator rotor

Fig. 3–159. Removing the A.C. generator rotor

3. CLUTCH LIFTER THREAD

A. Description

The clutch lifter thread is located between the clutch lever and the clutch lifter rod. It transmits the action of the clutch lever to the clutch rod during starting and changing of the gears. In other words, the clutch lifter thread controls the function of the clutch mechanism, and therefore, it indirectly affects the performance of the motorcycle. **(Fig. 3–160)**



① Left crankcase cover ② Clutch lifter

Fig. 3–160. Clutch lifter thread installation

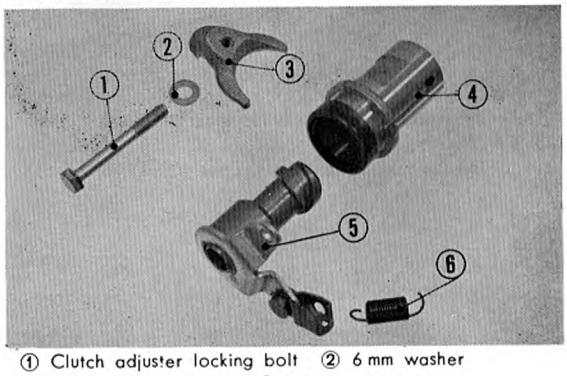
B. Disassembly

1. Remove the left crankcase cover.
2. Remove the bolt from the adjuster fixing piece and the clutch lever spring. The clutch lifter thread can then be disassembled. **(Fig. 3–161)**

C. Reassembly

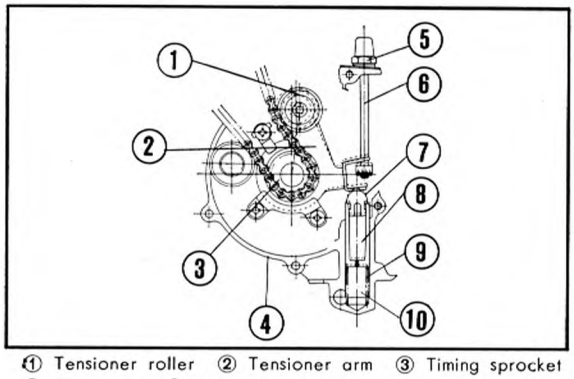
1. Apply grease to the clutch lifter thread before assemblying.

   Used HD type multi-purpose NLGI, No. 2.

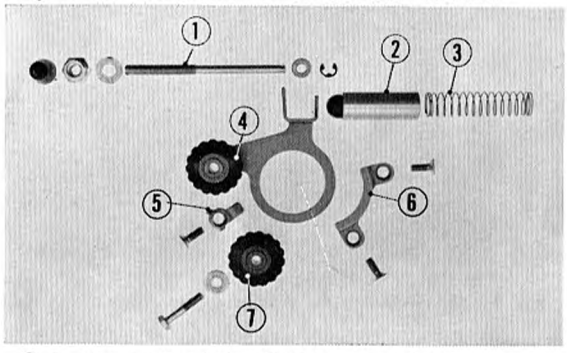


① Clutch adjuster locking bolt ② 6 mm washer ③ Adjuster fixing piece ④ Clutch adjuster ⑤ Clutch lifter thread ⑥ Clutch lever spring

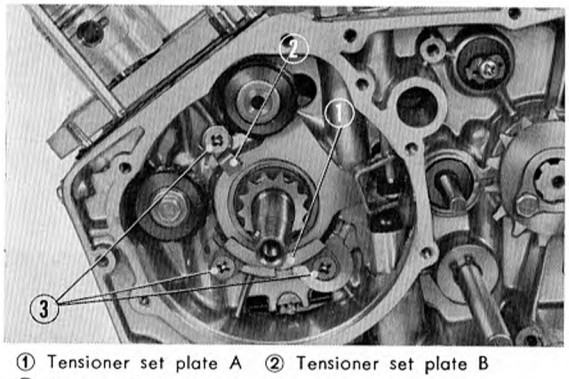
Fig. 3–161. Component parts of clutch adjuster



① Tensioner roller ② Tensioner arm ③ Timing sprocket
④ Crankcase ⑤ Adjust screw lock nut
⑥ Tensioner adjust bolt ⑦ Tensioner pushrod head
⑧ Tensioner pushrod ⑨ Tensioner spring
⑩ Oil damper chamber
Fig. 3–162. Construction of the cam chain tensioner



① Tensioner adjust bolt ② Tensioner pushrod
③ Cam chain tensioner spring ④ Cam chain tensioner
⑤ Tensioner set plate B ⑥ Tensioner set plate A
⑦ Cam chain tensioner roller
Fig. 3–163. Component parts of the cam chain tensioner



① Tensioner set plate A ② Tensioner set plate B
③ 6×16 cross screws
Fig. 3–164. Removing the tensioner set plates

4. CAM CHAIN TENSIONER

A. Construction

An automatic cam chain tensioner has been employed to simplify the maintenance and eleminate the adjustment of the cam chain. This is done by automatically applying pressure against the tensioner pushrod by means of the cam chain tensioner spring. The force is applied by the pushrod to one side of the "seesaw" type, tensioner to maintain proper tension to the cam chain at high speed; further, the location of the guide roller has been engineered to minimize the chain noise.

In addition, a manual adjusting feature is also provided to correct any stretch in the chain resulting due to the centrifugal force from extended riding. **(Fig. 3–162)**

B. Disassembly

1. Remove the breaker point cover, point terminal left cover, A.C. generator rotor, and then disassemble the A.C. generator stator.
2. Remove the cylinder head and disassemble the cylinder.
3. Unscrew the three tensioner set plate mounting screws. **(Fig. 3–164)**
4. Loosen the lock nut from the cam chain adjuster screw and after removing the circlip from the adjuster bolt with a plier, the tensioner pushrod and the tensioner spring can be disassembled.

C. Inspection

Check the cam chain tensioner roller for damage, distortion of the parts, and replace any defective parts.

D. Reassembly

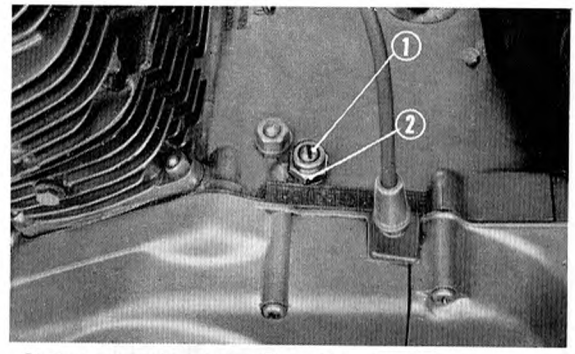
1. Perform the reassembly in the reverse order of disassembly.

(Note)

The tensioner adjust bolt should first be screwed all the way in and then gradually backed off until the proper tension is achieved.

Make the adjustment by applying a screwdriver to the upper portion of the bolt head and tighten the lock nut after completion. **(Fig. 3–165)**

If the adjusting bolt is loosened, the cam tensioner will be automatically tightened.



① Tensioner adjust bolt ② Locking nut.
Fig. 3–165. Adjusting the cam chain tension

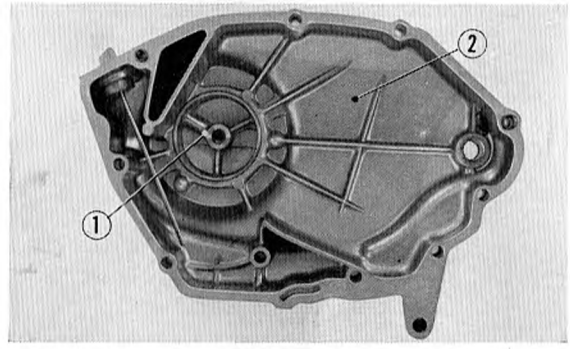
3.4 RIGHT CRANKCASE COVER ASSEMBLY

1. RIGHT CRANKCASE COVER

A. Construction

The right and left crankcase covers, house the engine primary components.

The oil filter cover is fitted to the right crankcase cover and provides the passage for lubricating oil. **(Fig. 3–166)**



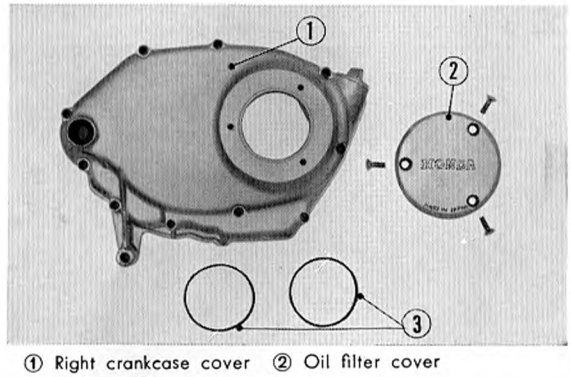
① Oil filter cover ② Right crankcase cover
Fig. 3–166. Right crankcase cover

B. Disassembly

1. Remove the kick starter arm from the kick pinion shaft.
2. By removing the ten screws securing the case cover, the right crankcase cover can be removed.
3. After unscrewing the three 6×16 screws, the filter cover can be removed.

(Caution)

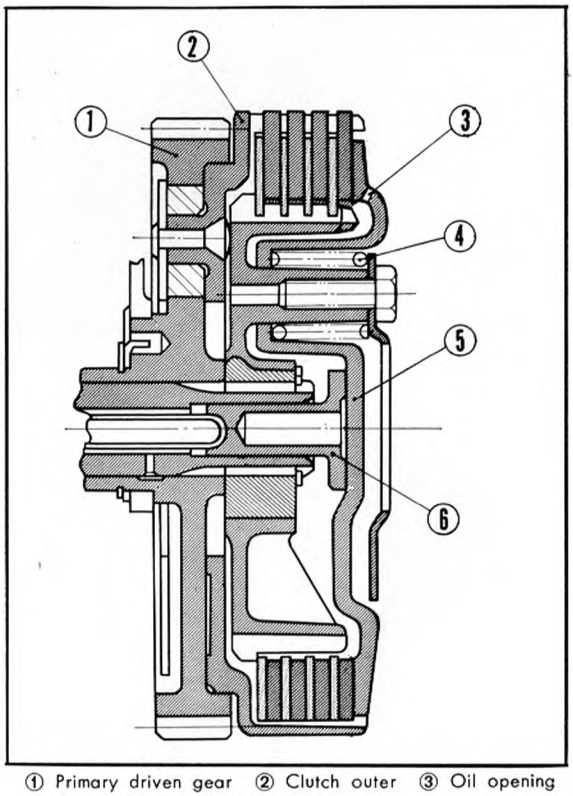
During operation, attention should be given to the two 64.5×2 O ring fitted to the filter cover to assure that there are no oil leaks. **(Fig. 3–167)**



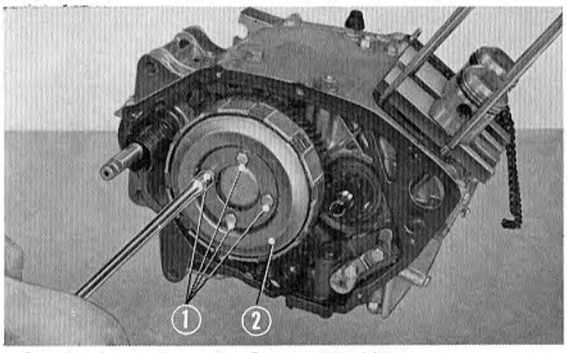
① Right crankcase cover ② Oil filter cover
③ 64.5×2 O ring
Fig. 3–167. Component parts of R. crankcase cover

C. Reassembly

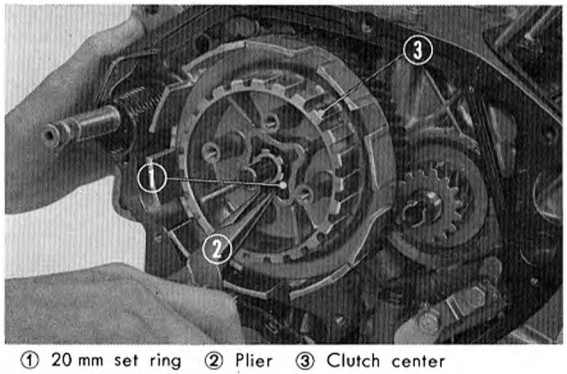
1. Before performing the assembly, inspect the crankcase and oil filter cover for cracks and also for any damages to the mating surfaces since they will cause oil leaks.
2. Clean the O ring and inspect for any damages; replace if necessary.
3. After installation of the screws, tighten them uniformly to prevent the covers from warping and cousing oil leaks.



① Primary driven gear ② Clutch outer ③ Oil opening
④ Clutch spring ⑤ Clutch pressure plate
⑥ Clutch lifter joint piece
Fig. 3–168. Sectional view of clutch assembly



① 6×20 hex. bolt ② Clutch assembly
Fig. 3–169. Removing the clutch assembly



① 20 mm set ring ② Plier ③ Clutch center
Fig. 3–170. Removing the clutch center

2. CLUTCH

A. Description and Operation

When the right crankcase cover is removed, the clutch complete is exposed. To the clutch outer, the clutch spring driving the clutch pressure plate is installed. The clutch plate is installed with the clutch friction disc between the clutch center with four 6×20 hex. bolts.

The clutch plate has internal teeth which fits over the machined grooves cut on the outside of the clutch center. Clutch center in turn is mounted on the transmission main shaft by spline. Hence, it and the transmission main shaft are essentially a single unit. The clutch plate, clutch center, and clutch pressure plate rotate as a unit.

On the other hand, to the groove cut on the exterior circumference of the clutch outer, the clutch friction disc is coupled by the collar entering the groove; freewheeling rotation with the transmission main shaft is obtained. Hence, while the clutch is connected, the clutch outer center, four clutch plates, four clutch friction discs, and clutch pressure plate are essentially a single unit through friction exerted by the clutch spring; rotation of the crankshaft is transmitted to transmission system.

When the clutch lever is gripped, the clutch adjuster rotates clockwise, the adjustment thread is pushed out by the square-headed thread in the clutch adjuster fitted to the left crankcase cover; this is pushed out by the clutch joint through the clutch rod. The clutch spring is compressed and the four clutch friction discs and four clutch plates become disengaged. Hence, the rotary motion of four clutch plates and four friction discs is not transmitted to the clutchouter. **(Fig. 3–168)**

B. Disassembly

1. Remove the right crankcase cover.
2. Remove the four 6×20 bolts ① securing the clutch pressure plate, separate the clutch friction discs and the clutch plates. **(Fig. 3–169)**
3. By removing the 20 mm set ring ①, clutch center ③ can be removed. **(Fig. 3–170)**
4. Remove the oil filter cap and extract the oil filter rotor.
5. Remove the 16 mm lock nut securing the primary drive gear.
6. By pulling up the turn stop, remove the two 6 mm hex. bolts securing the oil pump.

7. Remove the clutch outer together with the oil pump. **(Fig. 3-172)**

(Note)

This is removed at a right angle facing the transmission shaft. Care should be taken so that the transmission shaft is not damaged.

8. Remove the primary drive gear.

C. Inspection

1. Measurement of damage, thickness, distortion and one-side contact of the notch of the clutch friction disc.

Item	Standard Value	Serviceable Limit
Thickness	3.5 mm (0.1378 in)	
Width of claw	13.7~13.8 mm (0.539~0.543 in)	Replace if under 13.5 mm (0.5315 in)

2. Fatigue of clutch spring.

Item	Standard Value	Serviceable Limit
Free length	31.7 mm (1.2480 in)	Replace if under 31.0 mm (1.2205 in)
Pressure	21 mm/15~16 kg (0.8268 in/33.075~35.28 lbs)	

3. Measurement of clearance between the clutch outer notch and the clutch friction disc.

Item	Standard Value	Serviceable Limit
Clearance	0.2~0.35 mm (0.0079~0.0138 in)	Replace if over 0.8 mm (0.031 in)

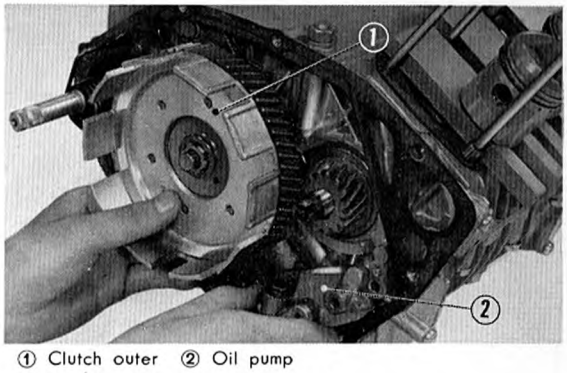
D. Reassembly

1. Install the primary drive gear.
2. The clutch outer and the oil pump should be coupled by the pump plunger and the unit should be coupled at a right angle to the transmission main shaft and the pump fitting stud bolts.
3. Tighten the two oil pump bolts.
4. Install the oil filter rotor.
5. Couple the clutch center to the spline of the transmission main shaft and set with the 20 mm set ring.
6. Four clutch plates and four clutch friction discs should be placed alternately. Assemble the clutch pressure plate, the clutch spring and the 6×20 bolts.

(Note)

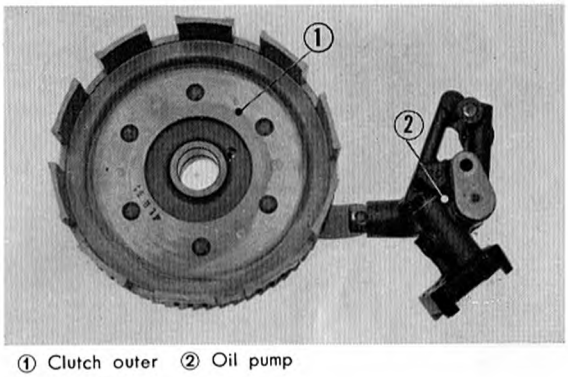
When the clutch pressure plate is installed, make sure the clutch lifter joint piece is in place.

7. Install the right crankcase cover and screws.



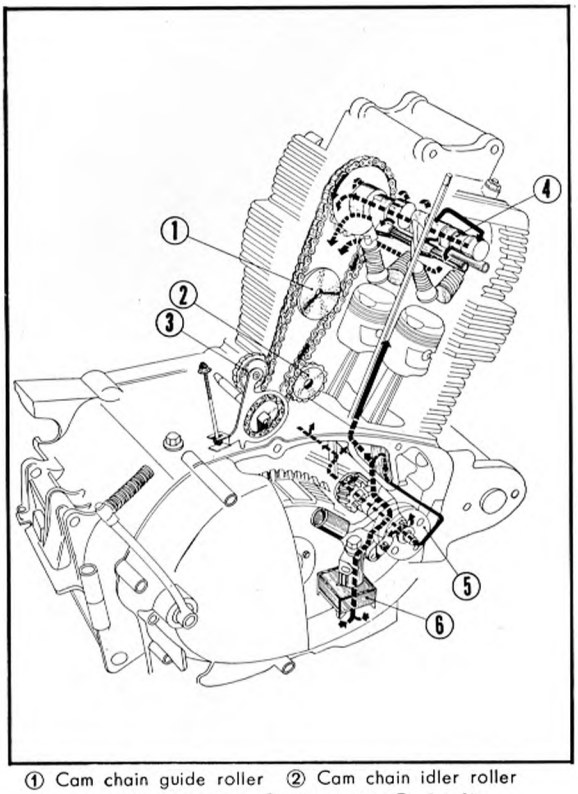
① Clutch outer ② Oil pump

Fig. 3-171. Removing the oli pump

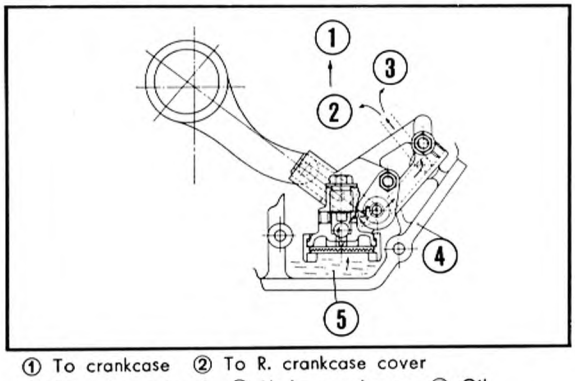


① Clutch outer ② Oil pump

Fig. 3-172.



① Cam chain guide roller ② Cam chain idler roller
③ Cam chain tensioner ④ Camshaft ⑤ Oil filter
⑥ Oil filter screen
Fig. 3–173. Lubrication diagram



① To crankcase ② To R. crankcase cover
③ To cylinder head ④ Under crankcase ⑤ Oil
Fig. 3–174. Sectional view of oil pump

3. OIL PUMP (Fig. 3–173, 174)

A. Description

The oil is picked up from the crankcase sump and routed through the oil passage to the oil filter where the impurities are removed by the centrifugally operating oil filter. The clean oil is then pressure fed through the upper crankcase to the right crankshaft bearing. The oil which enters the right and left crankcase outer rings is separated into two routes, one is fed to the roller bearing and the other enters the crankshaft to lubricate the connecting rod large end through the holes drilled in the crankshaft journals. The connecting rod small end is lubricated by oil mist.

The oil from the upper crankcase oil passage is fed to the top of the cylinder head through the hollow cylinder stud bolts. This oil is fed into the camshaft and lubricates the rocker arm. The oil lubricates the cam chain on its way down to the sump. The gears and bearings are lubricated by oil droplets and mists. The normal capacity of oil pump is 3200 cc (196 cu in) at 7200 rpm.

B. Disassembly

1. Remove the right crankcase cover.
2. Remove the oil filter rotor.
3. Separate the pump body together with the clutch.
4. By removing the 26 mm circlip, ① the pump rod ② can be separated from the clutch outer. **(Fig. 3–64)**
5. Extract the pump plunger pin ③ and remove the plunger ① at the tip of the pump rod. **(Fig. 3–65)**

C. Inspection

The normal capacity of the oil pump is 3200 cc (196 cu. in) at 7200 rpm ; if the capacity falls below 3,000 cc (184 cu. in) there is a danger of developing engine seizure, therefore, the pump should be repaired or replaced.

D. Reassembly

1. Assemble the pump in the reverse order of disassembly.

4. OIL FILTER

A. Operation

The engine oil is doubly filtered through the centrifugal filter and the mesh screen filter to assure clean supply of oil to the engine. **(Fig. 3–175)**

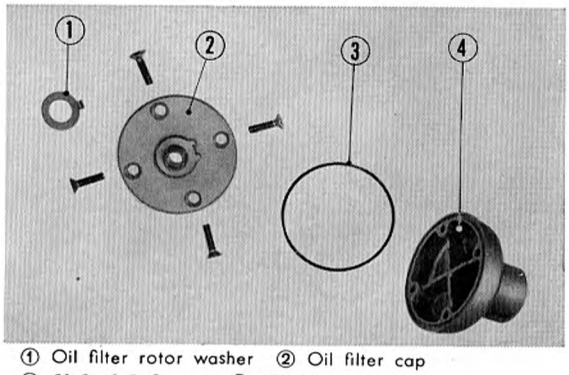
The screen filter is on the pump inlet side and the centrifugal filter is on the outlet side.

B. Disassembly

1. Remove the oil filter cover.
2. Remove the four 4×16 cross screws and oil filter cap.
3. Pull off the oil filter rotor.

C. Reassembly

1. After cleaning of all the parts, perform the reassembly in the reverse order of disassembly.



① Oil filter rotor washer ② Oil filter cap
③ 50.5×1.5 O ring ④ Oil filter rotor
Fig. 3–175. Oil filter

3.5 CRANKCASE

1. UPPER AND UNDER CRANKCASE

A. Description

The upper and lower crankcases are constructed of lightweight aluminum alloy and can be separated at the center lines of the crankshaft, transmission main shaft, and counter shaft.

In addition, the starting motor is mounted at the left front section of the CD125 crankcase.

(Note)

CD125A, CL125A and SS125A are not equipped with a starting motor.

In the upper surface of the upper crankcase, the cylinder stud bolts are inserted. **(Fig. 3–176)**

The under crankcase is equipped with the oil separator, and two drain plugs. **(Fig. 3–177)**

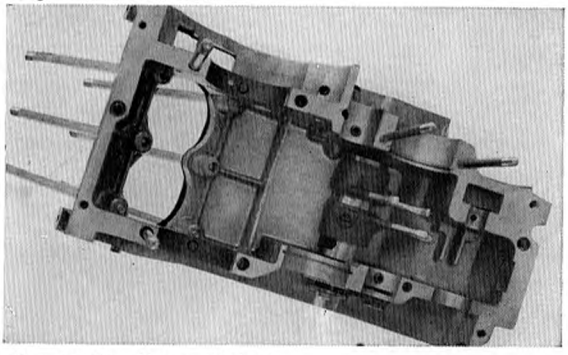


Fig. 3–176. Upper crankcase

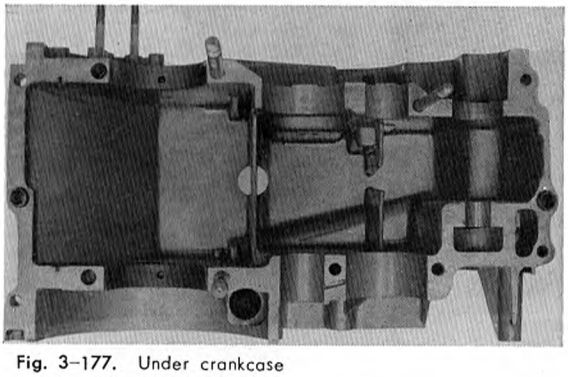
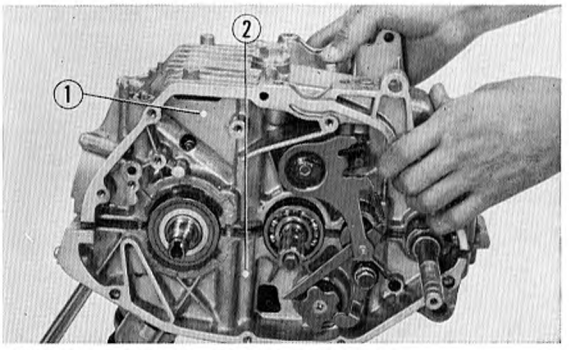


Fig. 3–177. Under crankcase

B. Disassembly

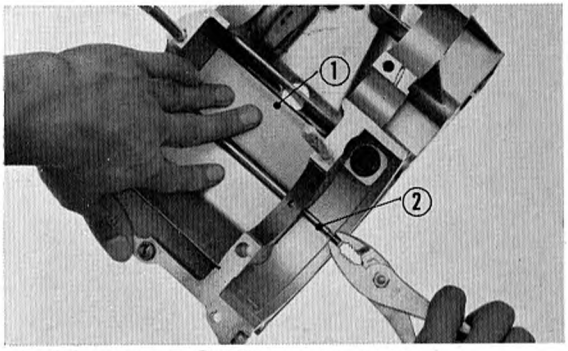
1. Drain oil in the crankcase.
2. Remove the cylinder head and cylinder in accordance with 3.2.1 B and 2.3.6 B.
3. Separate the right crankcase cover, oil filter, clutch and oil pump in accordance with 3.4.1, 3.4.2 and 3.4.3.
4. Separate the left crankcase cover and A.C. generator in accordance with 3.3.1 and 3.3.2.
5. Remove the gear shift spindle.
6. Remove the bolts from the under crankcase, and the upper crankcase can be removed from the under crankcase.



① Under crankcase ② Upper crankcase
Fig. 3–178. Removing the under crankcase

C. Inspection

Refer to Section 3.6.C on page 39.



① Oil separator ② Oil separator set bar

Fig. 3–179. Removing the oil separator

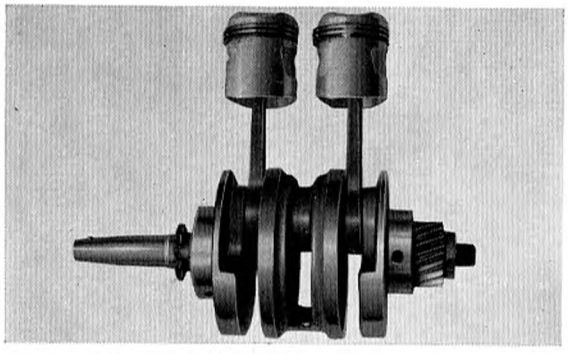


Fig. 3–180. Crankshaft assembly

D. Reassembly

1. Assembly should be performed with attention paid to the following points :
   - Clean the crankcase and inspect the mating surfaces of the crankcase for sign of leaks, scratches and other damages.
   - Apply liquid gasket to the mating surfaces of the case ; assemble after drying.

2. OIL SEPARATOR

A. Description

The oil separator is located in the forward section of the under crankcase, directly below the crankshaft.

Its primary function is to control the oil splashed by crankshaft counter weight, prevent oil penetration and controls the oil temperature.

B. Disassembly

Oil separator can be removed by pulling out the oil separator set bar. **(Fig. 3–179)**

C. Reassembly

Assemble the oil separator in the reverse order of disassembly.

3.6 CRANKSHAFT

A. Construction

The crankshaft journals are made of high carbon steel and the counterweights are of nickel-chrome-molybdenum steel, assembled by press fitting. Crankshaft is supported by a roller bearing and a ball bearing which takes the thrust load and are fixed in place by dowel pins. Sprocket to drive the cam chain is machined on the center shaft.

The oil is forced into the crank pin by centrifugal force to lubricate the connecting rod bearing. There is also a separate oil route to lubricate the main bearings. **(Fig. 3–180)**

B. Disassembly

1. Drain oil from the crankcase.
2. Separate the cylinder and cylinder head in accordance with 3.2. 1 B and 3.2. 6 B.
3. Separate the right crankcase cover, oil filter, clutch and oil pump in accordance with 3.4.1, 3.4.2 and 3.4.3.
4. Separate the left crankcase cover and A.C. generator in accordance with 3.3.1 and 3.3.2.
5. Remove the two 8 mm and a 6 mm hex. nuts from the upper crankcase and five 6 mm hex. bolts, two nuts and 8 mm hex. and blind nuts from the under crankcase.
6. Separate the lower crankcase from the upper crankcase, then the crankshaft can be removed.

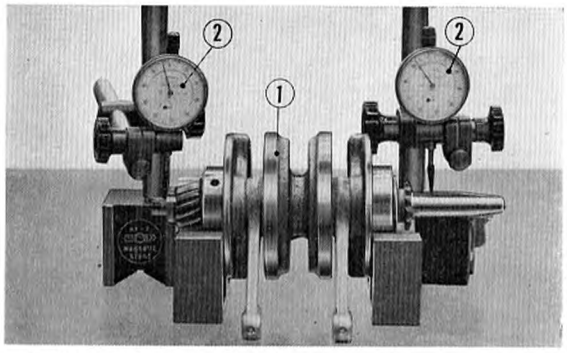
C. Inspection

(1) Support the crankshaft on V blocks at both bearing and measure the amount of runout. **(Fig. 3–181)**

Item		Standard Value	Serviceable Limit
Total runout	Left bearing web side at 30 mm (1.3 in)	0.02 mm (0.0008 in)	Replace if over 0.08 mm (0.0032 in)
	Right bearing web side at 26 mm (1.0 in)	0.02 mm (0.0008 in)	Replace if over 0.08 mm (0.032 in)

(2) The clearance in the bearing is measured by fixing the crankshaft on the centers and moving the bearing in the axial and vertical.

Item	Standard Value	Serviceable Limit
Axial clearance	Within 0.05 mm (0.0020 in)	Replace if over 0.1 mm (0.004 in)
Clearance normal to axis	Within 0.05 mm (0.0020 in)	Replace if over 0.1 mm (0.004 in)



① Crankshaft assy. ② Dial gauge
Fig. 3–181. Measuring the crankshaft run-out.

When the clearance in the axial direction becomes excessive, the crankshaft will move from side to side when engine is running and produce undersirable noises as well as causing uneven wear to the cylinder, piston and the timing sprocket.

D. Reassembly

Assemble the crankshaft in the reverse order of disassembly.

2. CONNECTING RODS

A. Description

The connecting rods are of molybenum steel and have an H-shaped section; The roller (2.5× 8.5 mm) is held by the roller retainer made of special aluminum alloy. Staggered rollers are used in order to increase the load capacity.

1. Measurement of deflection at the piston end of the connecting rod. Refer to Section 3.7.2B on page 41 and 42.

3. PISTON

A. Description

Refer to section 3.7 3. A on page 42.

B. Disassembly

Refer to section 3.7.3. B on page 42.

C. Inspection

1. Before inspection, carbon adhering to the piston head or ring groove should be removed, using care not to scratch the piston.

(Caution)

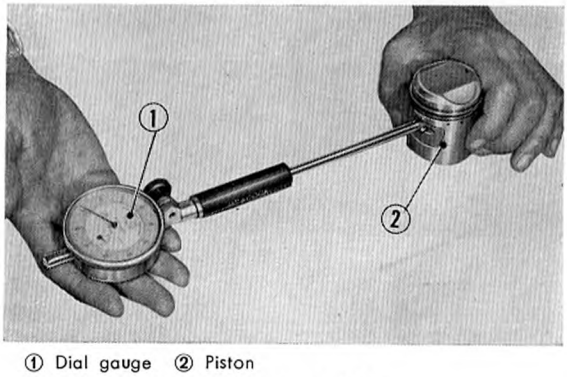
Sandpaper should not be used for removing carbon, use a carbon scraper.

2. Piston outside diameter.

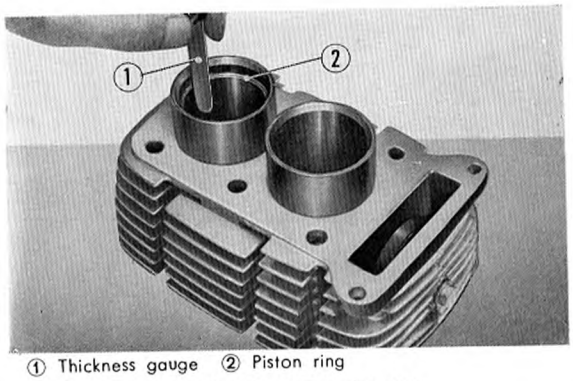
Item	Standard Value	Serviceable Limit
Head minor diameter	43.50~43.55 mm (1.713~1.715 in)	Replace if under 43.4 mm (1.7087 in)
Major diameter	43.98~44.0 mm (1.832~1.732 in)	Replace if under 43.9 mm (1.7283 in)

3. Ring groove clearance when a new piston ring is fitted.

Item	Standard Value	Serviceable Limit
Top ring	0.015~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 mm (0.004 in)
2nd ring	0.015~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 mm (0.004 in)
Oil ring	0.01~0.045 mm (0.0004~0.0018 in)	Replace if over 0.1 mm (0.004 in)



① Dial gauge ② Piston
Fig. 3–182. Measuring piston pin hole



① Thickness gauge ② Piston ring

Fig. 3–183. Measuring the piston ring gap

4. Piston pin hole. **(Fig. 3–182)**

Item	Standard Value	Serviceable Limit
Bore	13.000～13.006 mm (0.5118～0.5120 in)	Replace if over 13.05mm (0.5128 in)

5. For oversize pistons, there are three at intervals of 0.25 mm (0.01 in.)

D. Reassembly

Refer to section 3.7 3. D on page 44.

4. PISTON RINGS

Refer to section 3.7 4 on page 44.

B. Inspection

1. When the piston ring has been removed, it should be fitted into the cylinder approximately 15 mm (0.6 in.) from skirt of the cylinder at a right angle to the center line. Measurement of the gap should be made with a thickness gauge. **(Fig. 3–183)**

Item	Standard Value	Serviceable Limit
Top ring	0.15～0.35 mm (0.0059～0.0138 in)	Replace if over 0.8 mm (0.032 in)
Second ring	0.15～0.35 mm (0.0059～0.0138 in)	Replace if over 0.8 mm (0.032 in)
Oil ring	0.15～0.40 mm (0.0059～0.0158 in)	Replace if over 0.8 mm (0.032 in)

2. Tension of the piston ring is measured with a tension measuring instrument.

Item	Standard Value	Serviceable Limit
Top ring	0.34～0.63 kg (0.750～1.389 lbs)	Replace if under 0.24kg (0.529 lb)
Second ring	0.28～0.57 kg (0.617～1.257 lbs)	Replace if under 0.2 kg (0.441 lb)
Oil ring	0.50～0.80 kg (1.103～1.764 lbs)	Replace if under 0.4kg (0.882 lb)

C. Replacing the piston rings

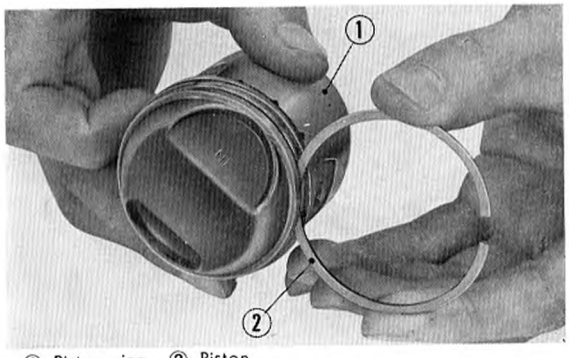
1. When a piston ring is reassemble, it should be fitted to the cylinder. Inspection should be made to determine if the gaps of the top and second rings are proper. If the gaps are somewhat less, they should be dressed with a file.

(Caution)

(1) When a gap is dressed with a file, it should be made perpendicular to the rings.

(b) If the piston ring gap is too small, seizure between the ring and cylinder occurs due to thermal expansion; if the gap is too large, oil penetration or gas leakage occurs.

2. When piston ring is assembled on the piston, any interference between the ring and the groove may prevent smooth operation. It is necessary to inspect for clearance, when new ring is fitted to the groove, by rotating the ring around the circumference. **(Fig. 3–184)**



① Piston ring ② Piston

Fig. 3–184. Inspection of the piston ring by rolling the ring around the piston

3.7 TRANSMISSION

A. Description

The transmission receives the rotary power from the crankshaft and through a series of gears, changes it to the desired speed and then transmits it to the drive sprocket to drive the rear wheel. All the gears are fully constant meshed, assuring smooth gear change.

Operation

Low : **(Fig. 3-185)**

The power from the crankshaft it transmitted through the clutch to the spline fixed driven gear on the transmission main shift ①. The power from the transmission main shaft ① is transmitted from the main shaft drive gear to the counter shaft low gear ②. However, the counter shaft second gear ③ which is splined to the counter shaft and is moved against the low gear ② by the shift fork and is locked by means of a dog, forming an single unit with the counter shaft to transmit the driving force to the drive sprocket ④ mounted on the left end of the counter shaft.

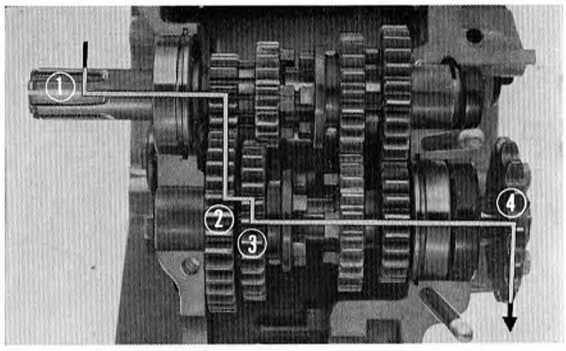


Fig. 3-185. Low gear

Second : **(Fig. 3-186)**

The main shaft third gear ② which is spline slide fitted to the main shaft ① is moved by the shift fork to lock with the second gear ③ by means of a dog, thus permitting the transmission of power from the main shaft to the counter shaft ④ by meshing the main shaft second gear with the splined counter shaft second gear ⑤ hence to drive the sprocket ⑥.

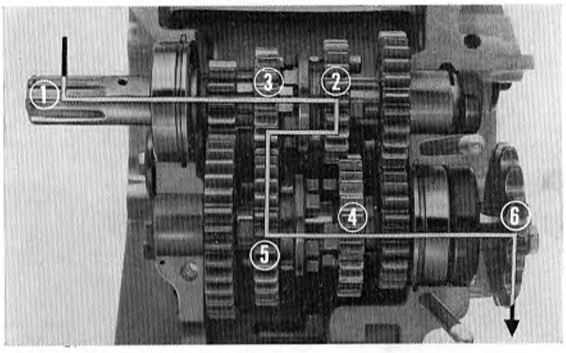


Fig. 3-186. Second gear

Third : **(Fig. 3-187)**

The power from the transmission main shaft ① is transmitted to the counter shaft third gear ③ by meshing with the main shaft third gear ②. The counter shaft second gear ④ which is spline slide fitted is moved by the shift fork to lock with the free rotating third gear ③ by means of a dog, this causes the counter shaft ⑤ to rotate and in turn drives the sprocket ⑥.

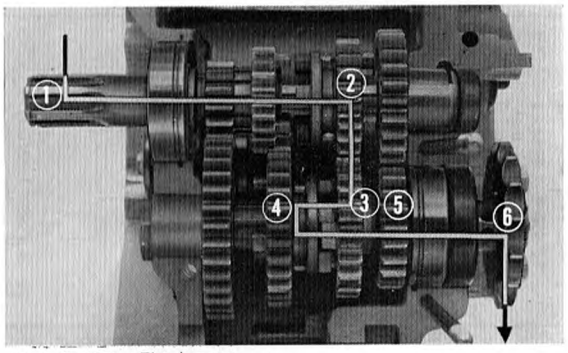


Fig. 3-187. Third gear

Top : **(Fig. 3-188)**

The main shaft third gear ③ is moved by the shift fork to lock with the free rotating top gear ③ by means of a dog, thus permitting the transmission of power from the main shaft ① to the counter shaft by meshing the main shaft top gear ③ with the fixed counter shaft ④ (top gear) to drive the sprocket ⑤.

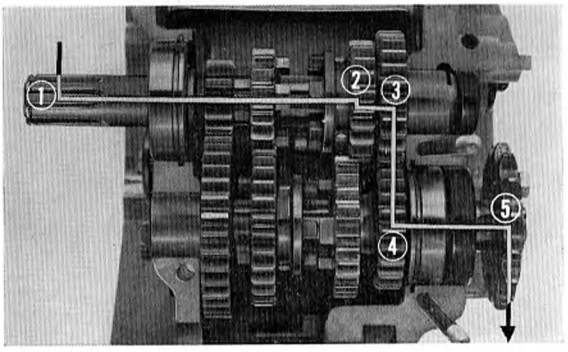


Fig. 3-188. Top gear

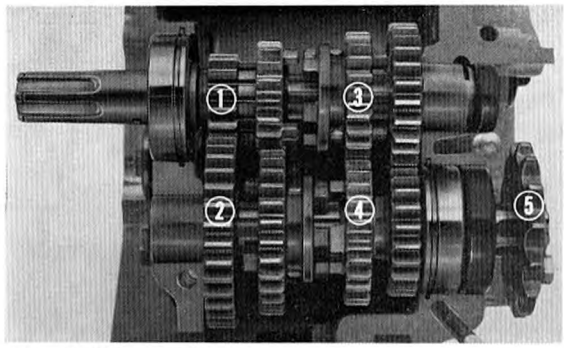
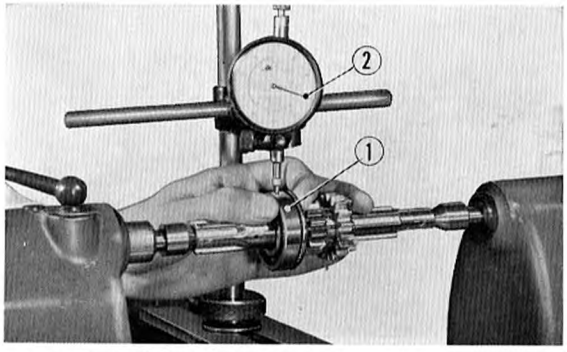


Fig. 3–189. Neutral



① Bearing ② Dial gauge

Fig. 3–190. Measuring clearance of the bearing

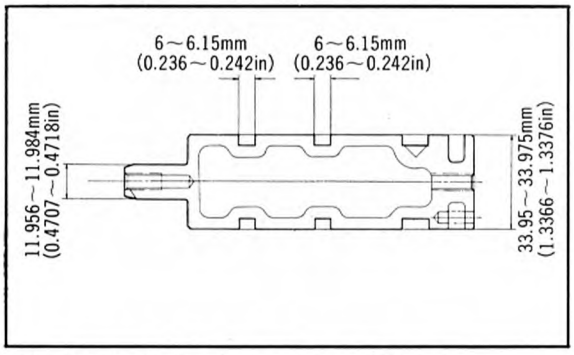


Fig. 3–191. Sectional view of gear shift drum

Neutral : **(Fig. 3–189)**

The gears are not locked. The main shaft low gear ① is meshed with the counter shaft low gear ② and the main shaft third gear ③ is meshed with counter shaft third gear ④, however, the counter shaft gears rotate freely and therefore no power is delivered to the sprocket ⑤.

C. Inspection

1. Main shaft to main shaft gear clearance.

Item	Standard Value	Serviceable Limit
Second gear	0.011~0.053 mm (0.0004~0.0021 in)	Replace if over 0.1 mm (0.004 in)
Top gear	0.016~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 m(0.004 in)

2. Counter shaft to counter shaft gear clearance.

Item	Standard Value	Serviceable Limit
Low gear	0.016~0.045 mm (0.0006~0.0018 in)	Replace if over 0.1 mm (0.004 in)
Third gear	0.011~0.045 mm (0.0004~0.0021 in)	Replace if over 0.1 m(0.004 in)

3. Bearing clearance. **(Fig. 3–190)**

Item	Standard Value	Serviceable Limit
Axial clearance	Within 0.05 mm (0.002 in)	Replace if over 0.1 mm (0.004 in)
Radial clearance	0.01~0.025 mm (0.0004~0.001 in)	Replace if over 0.05 mm (0.002 in)

4. Shift drum groove **(Fig. 3–191)**
   Standard value : 6.0~6.15 mm (0.236~0.242 in)
   Serviceable limit

3.8 GEAR SHIFT

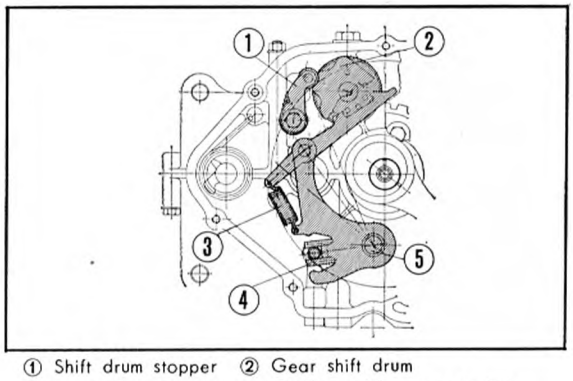
A. Description

As the gear change pedal is depressed, the gear shift splindle is rotated and the gear shift pawl on the end of the gear shift arm engages with the gear shift pin on the right side of the gear shift drum and causes it to turn.

A groove is machined on the surface of the drum, forming a cam, and as the drum is rotated, the shift fork riding in the groove is actuated by the contour of the groove to perform the gear shifting action.

Further, there is a gear shift return spring which brings the pedal back to the original position and prepares for the next gear operating sequence.

On the SS125A and CL125A models, the neutral position is determined by the neutral stop pin. As shown in Fig. 3–192–2, the gear shift drum is rotated by the gear shift fork, and when the neutral groove moves to a point directly below the neutral stop pin, the spring loaded pin drops into the groove and locks the drum in the neutral position. **(Fig. 3–192)**

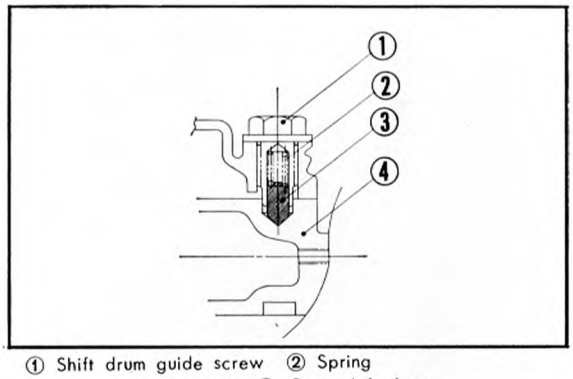


① Shift drum stopper ② Gear shift drum
③ Gear shift arm spring ④ Gear shift return spring
⑤ Gear shift spindle comp

Fig. 3–192–1. Gear shift arm

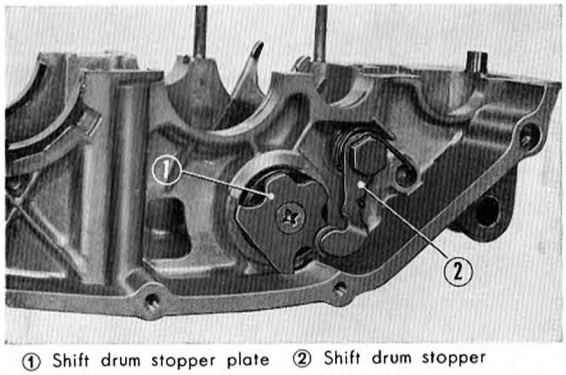
B. Disassembly

1. Separate the crankcase into upper and lower halves by following the procedure outlined for the disassembly of the transmission.
2. Remove the shift fork guide pin clip installed on the shift fork and separate the guide pins.
3. Remove the neutral switch rotor and stator installed on the right side of the shift drum.
4. Remove the shift drum stopper arm pivot which hold the shift drum stopper plate and then remove the stopper. **(Fig. 3–193)**



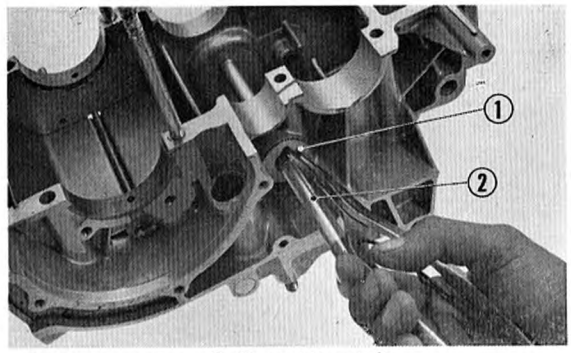
① Shift drum guide screw ② Spring
③ Neutral stopper pin ④ Gear shift drum

Fig. 3–192–2. Sectional view of gear shift drum (SS125A/CL125A)

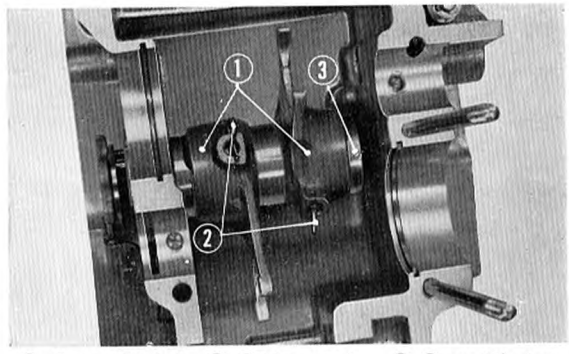


① Shift drum stopper plate ② Shift drum stopper

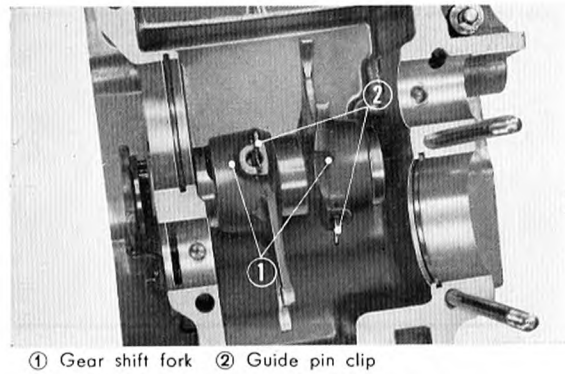
Fig. 3–193. Removing the shift drum stopper



① 12 mm set ring ② Gear shift spindle
Fig. 3–194. Removing the gear shift spindle



① Gear shift fork ② Guide pin clip ③ Gear shift drum
Fig. 3–195. Removing the gear shift drum



① Gear shift fork ② Guide pin clip
Fig. 3–196. Installing the gear shift drum

5. The gear shift, gear shift return spring, and gear shift spindle side stopper are all assembled by a circlip, therefore, by removing the circlip with the snap ring plier, the spindle can be disassembled. **(Fig. 3–194)**

6. Remove the gear shift return spring with a spanner or with a deep walled socket wrench.
7. Loosen the gear shift fork guide screw in the upper crankcase and remove ; at the same time, remove the shift drum guide collar.

   For model SS125 and CL125A, remove the neutral stopper pin and spring.
8. Pull out the shift drum from the side of the crankcase cover. **(Fig. 3–195)**

C. Inspection

1. Inspect the gear shift fork for bend.
2. Check the gear shift guide pin for excessive wear.
3. Check the shift drum stopper for looseness due to excessive wear.
4. Check the gear shift spindle return spring for loss of tension.
5. Check the return spring pin security.

D. Reassembly

1. Insert the gear shift arum from the right side of the upper crankcase and assemble the gear shift form within the crankcase, being careful that the gear shift fork is centrally positioned.
2. Assemble the shift drum guide collar on the drum with the set screw.
3. Assemble the shift fork with the gear shift fork guide pin. Make sure that the gear shift fork guide pin is inserted in the correct position.
4. Assemble the shift drum stopper.
5. Assemble the neutral switch rotor and stator ; check to make sure that the switch is making contact in the neutral position.
6. Insert the gear shift spindle from the right side and then assemble the gear shift spindle side stopper from the left side and lock in position with the circlip.
7. Assemble the crankshaft and the transmission gear assembly into the upper case. Assemble and bolt the lower crankcase.
8. Finally, assemble the crankshaft in accordance with the assembly procedure.

3.9 KICK STARTER

A. Description

The kick starter is designed to prevent the ratchet noise following the start of the engine ; it is of the same design as the C50 and C65.

As the kick stater pedal is depressed, the kick starter spindle will revolve, causing the ratchet to move along the spiral groove in the drum due to action of the ratchet spring, and with the pinion to transmit the action to the counter shaft low gear, main shaft primary driven gear and then finally rotates the crankshaft which is directly driven by the primary drive gear. **(Fig. 3–197)**

When the engine starts, and as the pinion speed exceeds the spindle speed ; the ratchet due to the rotation of the pinion will turn in the left hand direction in reference to the spindle. Because of the left hand square thread action of the set spring, the ratchet will separate from the pinion.

The kick starter spring returns the spindle to the original position, disengaging from the pinion and is poised for the succeeding kick starter operation.

B. Disassembly

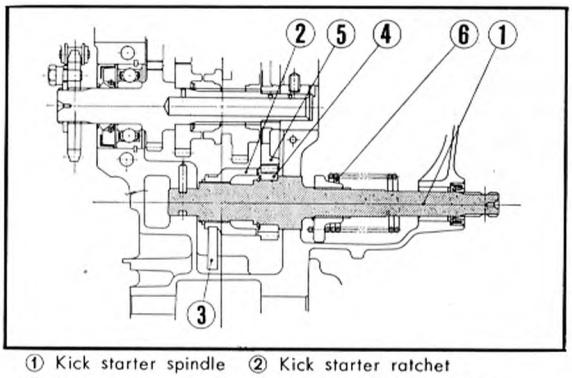
1. By following the disassembly procedure for the transmission, the upper and under crankcases can be separated, permitting the disassembly of the kick starter spindle.
2. Remove the kick starter spindle.

C. Inspection

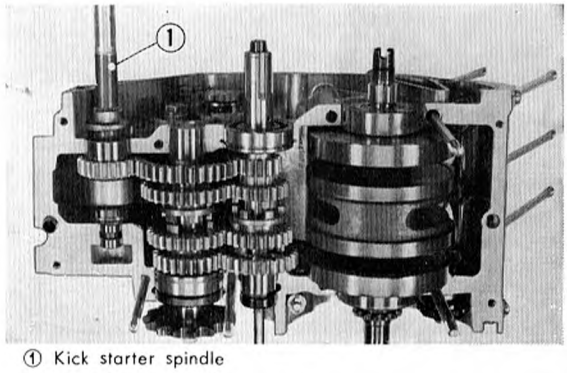
Check for excessive wear of the ratchet, and the gear teeth of the pinion ratchet.

D. Reassembly

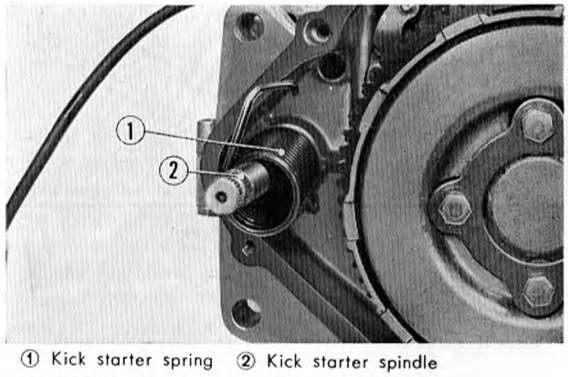
Perform the assembly in the reverse order of disassembly.



① Kick starter spindle ② Kick starter ratchet
③ Kick starter ratchet spring ④ Kick starter pinion
⑤ Counter shaft low gear ⑥ Kick starter spring
Fig. 3–197. Sectional view of kick starter



① Kick starter spindle
Fig. 3–198.



① Kick starter spring ② Kick starter spindle
Fig. 3–199. Kick starter spring

3.10 CARBURETOR (CD125, CD125A, SS125A, CL125A)

It is an already known fact that the carburetor is an instrument which supplys fuel to the engine, however, this CVD type carburetor, in addition, controls the amount of air taken into the engine by controlling the throttle valve, utilizing the suction pressure to vary the venturi area properly in proportion on the engine speed. The automatic control constant pressure throttle valve has the following features.

(1) Increased maximum speed
(2) Increased acceleration
(3) Increased climbing ability
(4) Increased fuel economy
(5) Good stability at low speed

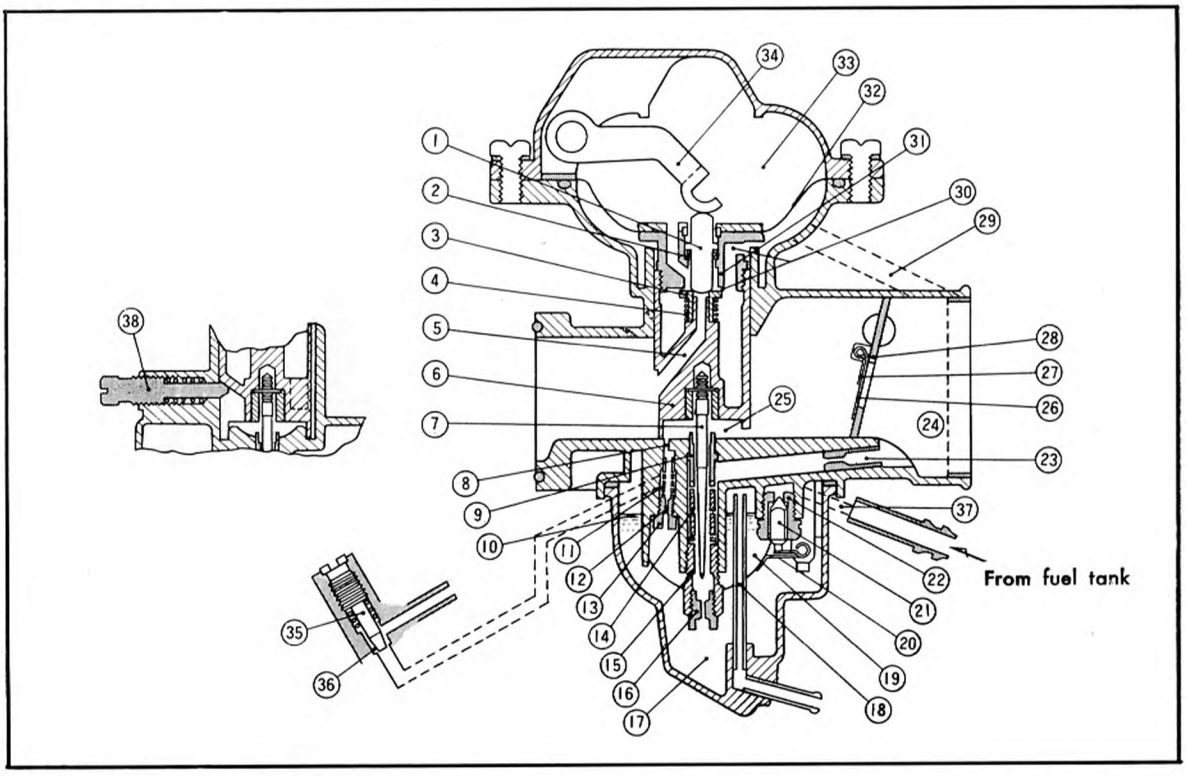


Fig. 3–200. Sectional view of Carburetor

DESIGN

1. AIR FLOW

The air which passes the air cleaner flows through the air inlet ㉔, under the throttle valve ⑥, and after passing through the venturi ㉕, enters the engine. The engine output is determined by the volume of air taken into the engine, therefore, the necessary amount of air is controlled by varying the venturi area through the vertical movement of the throttle valve.

A. Acceleration

When the throttle lever ㉞ is opened, the change rod ① is raised by the action of the spring ②, at the same time, spring ④ causes the change valve to rise, hitting the seat ㉛. The passageway ㉚ to the atmosphere is closed, separating the change valve ③ and change rod ① and the vacuum pressure passage ⑤ is opened to the vacuum chamber ㉝ at the top side of diaphragm ㉜. As the engine vacuum pressure is applied to the vacuum chamber ㉝, and depending upon the pressure differential between the bottom side of the diaphragm and the vacuum chamber, throttle valve is opened by the amount of force applied by the weight of the throttle valve assembly. The throttle valve is opened by a set amount which is determined by the point where the change rod contacts the throttle lever ㉞.

B. Cruising

The amount of air taken into the engine remains constant at the point where the change rod ① comes in contact with the throttle lever ㉞ and causes the throttle ⑥ to stop. However, when climbing a grade, a load will be imposed on the engine with a consequence drop in rpm which will cause a decrease in the amount of air taken in. As the amount of inlet air is reduced, the vacuum pressure in the vacuum chamber ㉝ above the diaphragm also drops until the force of the throttle valve assembly and the vacuum pressure balances. The throttle valve is closed and the venturi section ㉕ maintains a constant air flow to provide good fuel atomization.

C. Deceleration

When the throttle lever ㉞ is lowered, the change rod ① shuts off the vacuum pressure ⑤ and pushes open the air passage ㉚ to the atmosphere. This permits the atmospheric pressure to enter above the diaphragm and equalizes the pressure both above and below the diaphragm and the throttle valve readily returns with the assistance of the throttle lever return spring.

2. FUEL SYSTEM

A vacuum pressure is produced directly below the throttle valve ⑤ by the passage of the air through the venturi ㉕. The fuel discharge outlet is located in this area. This carburetor has two systems, the main and the slow systems.

A. Main system

The fuel passes through the main jet ⑯ and enters the needle jet holder ⑮ where it mixes with the bleed air entering from the bleed hole located around the needle jet holder ⑮. The fuel air mixture passes by the opening between the needle jet ④ and jet needle ⑦ and is discharged from below the throttle valve ⑤. It is here that the mixture is combined with the main air and is taken into the engine after being atomized.

B. Slow system

The air which enters from the inlet ㉔ passes through the outside ㊱ of the air screw ㉟ where it is metered and enters the slow jet bleed hole ⑪ where it mixes with the fuel which enter through the fuel hole ⑫ of the slow jet ⑬ to produce a rich mixture and is discharged from the pilot outlet at a point under the throttle valve to mix with the air from the air inlet before being taken into the engine.

3. FLOAT CHAMBER

The carburetor must provide a proper mixture of fuel at different throttle openings and engine speeds, and in order to accomplish this, the fuel level in the carburetor must be maintained constant. The float chamber functions to serve this purpose. The fuel from the tank enters the float chamber ⑦ through the fuel inlet passage ㊲ between the float valve seat ㉒ and float valve ㉑ and fills the chamber to the level where the float ⑲ rises to shut off the flow of the fuel by seating the float valve against the valve seat by the action of the float arm ⑳. As the consumption of the fuel lowers the fuel level in the float chamber, the float will follow the fuel level and the fuel will start to enter the chamber between the opening of the float valve and valve seat to maintain a constant fuel level. This sequence is recycled to maintain a constant fuel level. A spring is incorporated in the head of the float valve which comes in contact with the float arm. The purpose of this spring is to prevent the float valve from oscillating so that a constant fuel level can be maintained even when the vehicle is driven over rough or bad roads. It further serves to prevent any shock between the float valve and seat, thereby reducing the amount of wear to those parts. Next, a description of the overflow pipe ⑱ will be given. When any foreign substance becomes lodge in the float valve ㉑ and causes the fuel to overflow from the needle jet ⑨ or the slow jet ⑧, the fuel will enter the engine and cause the engine oil to thin out or may wet the air cleaner element. In order to prevent such a condition, an overflow pipe ⑱ has been incorporated in the float chamber. At normal fuel level. the pipe opening is above the fuel level and it serves no purpose but when the overflow condition exists and the fuel level rises, the fuel will drain out of the overflow pipe ⑱ to the outside.

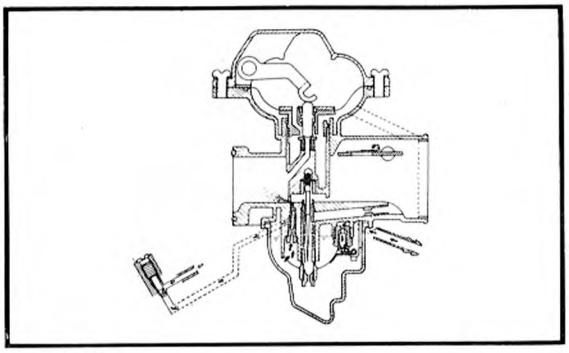


Fig. 3–201.

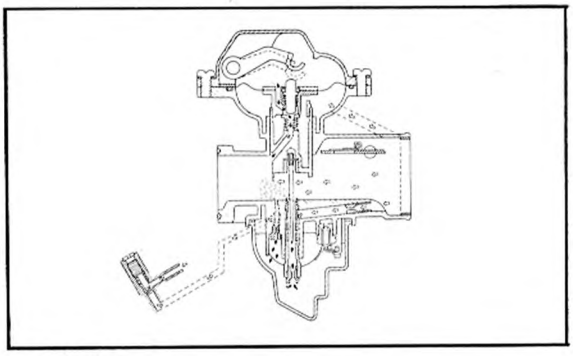


Fig. 3–202.

4. ACCESSORIES FOR STARTING

For starting in cold weather, a rich fuel mixture is momentarily required, to reserve this purpose, a choke valve ㉘ and a fast idling feature is incorporated in the carburetor. A relief valve ㉖ is included in the choke valve and is held closed by the spring ㉗. By raising the choke lever to the maximum height, the choke valve ㉘ closes and the air entering from the air intel is restricted. When the starting motor is engaged with the throttle lever ㉞ opened approximately 1/4, the fuel will be drawn out of the pilot outlet ⑧ and the needle jet ⑨ by the vacuum pressure. At the same time, the vacuum pressure will cause the relief valve ㉖ to open by the proper amount to provide an ideal fuel mixture to effect an engine start. As the engine starts, the vacuum pressure becomes a greater and the relief valve is opened further to provide the proper fuel mixture to warm up the engine. In this manner, the throttle valve ⑥ movement causes the relief valve to operate and, therefore, the operation of the choke valve is not required to warm up the engine. Merely open the choke valve after the engine warms up.

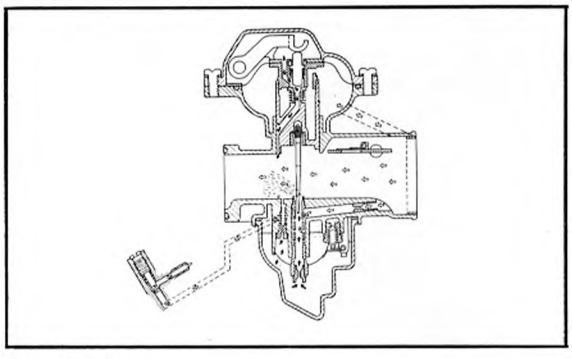


Fig. 3–203.

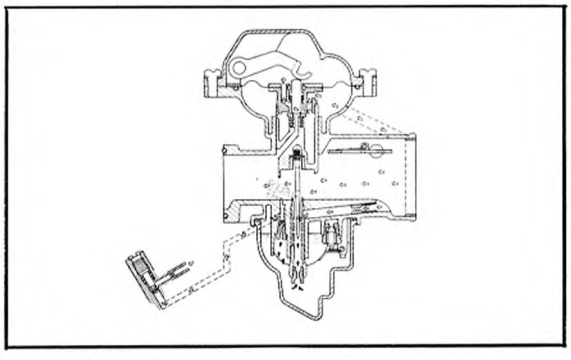


Fig. 3–204.

FUNCTION OF THE MAIN COMPONENTS

The main components of the carburetor functions in the following manner.

1. MAIN JET

The function of the main jet is to control the fuel discharge at full throttle opening (driving at maximum speed) and to provide the proper fuel air mixture. However, the main jet will also have a varying degree of effect in the vicinity of 1/2 throttle opening. The main jets are numbered, the larger the number bigger the opening will be and provides a richer fuel-air mixture.

2. AIR JET

At full throttle opening, the fuel-air mixture has a tendency to become rich, and in order to prevent this condition, a bleed air is added to the fuel through the needle jet holder. The purpose of the air jet is to meter the amount of this air ; the larger the air jet, more air will be added to the fuel mixture and leaner fuel mixture is provided. Also, by mixing the air with the fuel, better atomization will be assured.

3. NEEDLE JET

At full or intermediate throttle opening, the needle jet will once again meter the fuel which had been metered by the main jet. The control is accomplished together with the jet needle, which will be described in the following paragraph. The hole of the needle jet is made very accurately.

4. JET NEEDLE

The jet needle together with the jet described in the previous paragraph, meters the discharge of the fuel mixture in the 1/4 to 3/4 range of the throttle range. The long tapered needle is position directly above the needle jet opening with the tapered end located within the jet opening. The jet needle moves up and down with the throttle to control the fuel mixture proportionally to the throttle opening. There are five grooves on the head of the jet needle head; by resetting the set clip toward the lower groove, a richer fuel mixture will be provided.

5. THROTTLE VALVE

The throttle valve regulates the amount of fuel air mixture taken into the engine to control the output and speed of the engine. In addition, it serves a very important function in that it controls the fuel mixture. There is a cutaway on the throttle valve on the air inlet side which affects the vacuum pressure that controls the function of the needle jet. The use of the throttle valve with different size cutaway will control the discharge rate of the fuel, which changes the fuel-air ratio. The larger throttle valve cutaway number will provide leaner mixture, however, this is only effective within the lower range of the throttle opening and has no effect above 1/2 throttle opening.

There is also a throttle stop screw which sets the idling speed. Turning this screw IN will raise the idling speed and the speed will lower when the screw is turned OUT.

6. SLOW JET

The slow jet controls the fuel at slow speed and at idling by regulating the air entering from the air bleed and produces a fuel-air mixture which assists in the atomization of the fuel. The slow jet, like the main jet, provides a richer fuel mixture when a jet of larger number is used.

7. AIR SCREW

The air screw regulates the air entering the slow system by controlling the pilot which mixes with the fuel which passes through the slow jet. Turning the screw IN will richer the mixture and turning the screw OUT will lean the mixture.

8. FUNCTIONAL RANGE OF THE RESPECTIVE COMPONENTS

In summarizing the descriptions stated above, the functional range of the respective components are as follows: from throttle close to 1/8 open-air screw, 1/8 to 1/4 open-cutaway, 1/4 to 3/4 open-jet needle and 3/4 to full throttle opening – main jet.

ADJUSTMENT

1. HIGH SPEED ADJUSTMENT

During driving, if the speed increases when the choke valve is closed slightly, it is an indication that the fuel mixture is lean. In which case, replace the main jet progressively with the next larger size until properly adjusted. The main jet sizes below #100 are, #98, #95 and #92 and for sizes above #100 are #105, #110 and #115. In the opposite case, if the speed should fall off when the choke valve is closed, the main jet size is proper, or else, it may be too large. In which case, follow the procedure below to make the determination.

A. Properly set

When after replacing the main jet with one of a smaller size and if it is found to cause a drop in speed, and an increase in speed when the choke is slightly closed, it is an indication that the main jet is too small. The replaced jet can be considered to be of the proper size.

B. Main jet too large

When the jet is too large, progressively replace the jet with one of a smaller size until the condition in paragraph a above occurs and make the adjustment accordingly.

2. INTERMEDIATE SPEED ADJUSTMENT

The adjustment within 1/8 to 3/4 throttle opening is made by the changing the position of the clip on the jet needle groove and the replacement of the throttle valve cutaway. However, the throttle valve cutaway will affect the fuel mixture between idling and 1/4 throttle opening. In the intermediate speed range, it is recommended that the jet needle be adjusted within the range of good acceleration as this will prove to give better fuel economy.

A. Jet needle

(1) When excessive black smoke is emitted from the exhaust during intermediate speed, it is an indication of rich fuel mixture, therefore, lower the jet needle by one groove.
(2) During driving, if the engine misses or bucks, raise the jet needle one groove.

B. Cutway of the throttle valve

The throttle valve with a larger number stamped on the cutaway will give a leaner mixture. The throttle valve will affect the performance of the slow speed as well as the intermediate speed, therefore, the range affected should be considered when making the adjustment.

3. Slow Speed Adjustment

The fuel mixture adjustment between idling and 1/8th throttle opening is accomplished with the air screw and the cutaway of the throttle valve.

A. Air screw

The mixture adjustment at idle is made by the air screw. Turning the screw clockwise will give a rich mixture and turning in the opposite direction will lean the mixture. Not only is the idling screw used to make the idling adjustment but it also should take into consideration the mixture condition at the point where the throttle starts to open so that there is a smooth transition from the idling speed to the start of throttle opening speed.

B. Adjusting with the throttle cutaway

At a point 1/8th throttle opening, the air screw may no longer be effective in adjusting the fuel mixture. In such a case, replace the cutaway. If the mixture is too rich, replace the cutaway with one of a larger number and if the mixture is too lean, replace with one of a smaller cutaway number.

C. Idle adjustment

Idle adjustment is made by the use of both the throttle stop screw and the air screw by the following procedure.

(1) Use the throttle stop screw to set the engine to the proper speed.
(2) Manipulate the air screw back and forth slowly to obtain the point of maximum speed.
(3) Reset the throttle stop screw to bring the speed back to the normal.
(4) In this position, recheck the air screw to assure that the setting is correct.
(5) After completing the idle adjustment, check the engine response by snapping and accelerating the throttle. Perform this check between 1/8 to 1/4 throttle opening.

c. In this position, measure the distance the float bottom ⑤ and the body flange area ⑥ with the gauge ⑦, this is the height "h". The tolerance is 1 mm, the float may be depressed 1 mm or there may be a clearance of 1 mm between the gauge and the float. This much tolerance will not adversely affect the operation. If the float is out in excess of this amount, make the adjustment by bending the lip of the float arm ③. There is a spring incorporated in the end of the float valve ② which will permit the end of the float valve to submerge and will give and erroneous reading, therefore, exercise care when determining the point of contact. Improper measurement and adjustment will not give the proper fuel level.

4. FUEL LEVEL ADJUSTMENT

The float level is specified by the height of the float "h" shown in figure 3-177. The float adjusting procedure is described below in conjunction with figure 3-177. h=21.0 mm (0.827 in)

a. Invert the carburetor, in this condition, the weight of the float ① has caused the float arm ③ to bear against the float valve ④ and the spring is compressed into the valve. This is not the normal fuel level position.

b. Next, set the carburetor as shown in the figure with the float pin ④ toward the top, tilt the carburetor so that the float ① is on the bottom with the float arm ③ in the position so that it is just about to separate from the end of the float valve ② and set in this position. (the arm will separate from the end of the valve when the carburetor is raised approximately 70°, therefore, about 10° from this point is sufficiet, i.e., where the arm is not compressing the valve end).

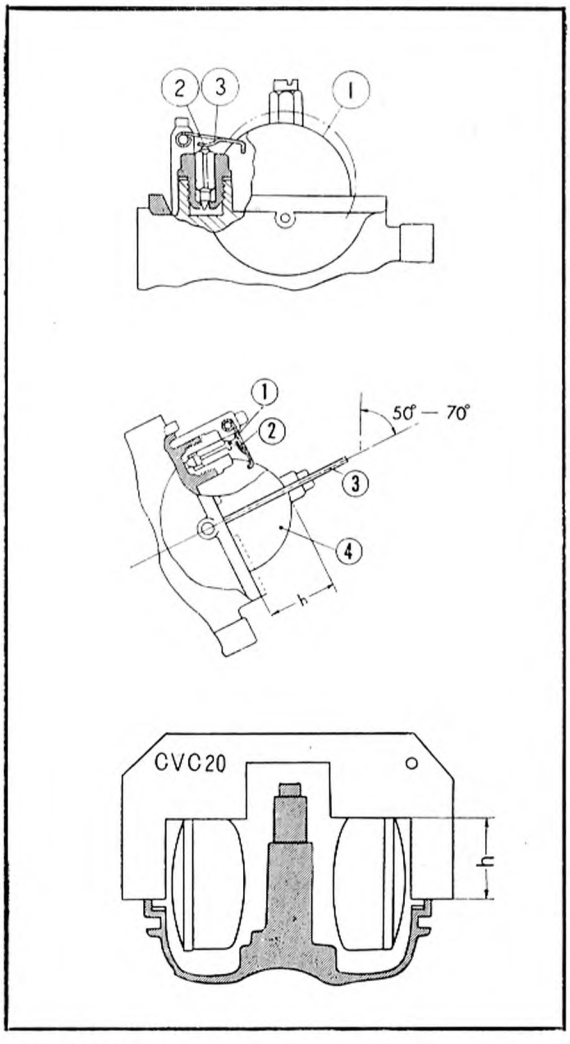


Fig. 3-205.

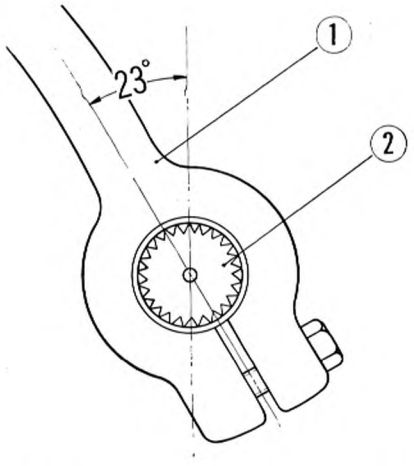
Setting specification (CD125, CD125A, SS125A, CL125A)

Model carburetor type		CVC21HA
Setting mark		B
Main bore		21φ (0.827 in)
Main jet		# 95
Air jet		#100
Air bleed	AB 1	0.6φ×4
	AB 2	0.6φ×2
	AB 3	0.6φ×2
	AB 4	0.6φ×2
	AB 5	0.6φ×2
Needle jet		2.6φ – 3.4φ
Jet needle		18237-3 stage
Cut-away (throttle valve)		#2.5 (Width 1.5, depth 0.5)
Air screw		1⅛ ±⅛
Slow jet		#3.5 (0.7φ×2×4)
Valve seat		1.7φ
Pilot out let		0.8φ P=7.8
Fuel level		21 mm (0.827 in)

INSTALLATION OF THE CD 175 KICK STARTER ARM

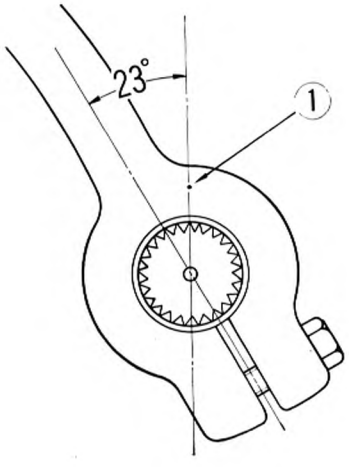
The kick starter arm is mounted on the kick starter spindle at an angle of 23° toward the rear from the vertical position. By following the procedure below, the arm can be installed without the aid of any jig.

1. If there is no alignment mark, install the kick starter arm so that the center of the arm is rotated two serrations toward the rear of the vertical position.



① Kick starter arm ② Kick starter spindle

2. The kick starter arm provided with a punch alignment mark should be positioned so that the mark lies on the vertical plane passing through the center of the kick starter spindle.



① Punch mark

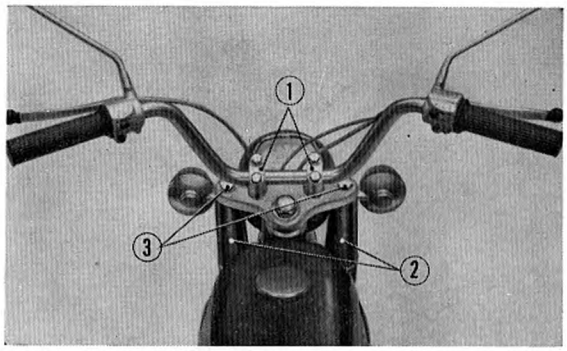
3. Tighten the locking bolt.

4. FRAME

4.1 STEERING HANDLE

A. Description

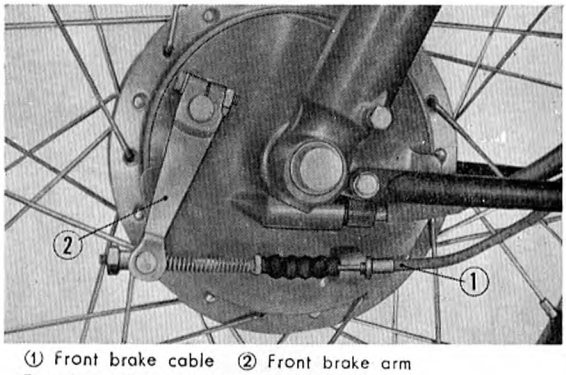
The steering handle is made of high strength steel pipe, and is mounted on the front fork top bridge by the handle pipe holder ①. The fork top bridge is mounted on the front cushions ② by two front fork bolts ③. All control cables are exposed to simplify steering handle replacement. **(Fig. 4–1)**



① Handle pipe holder ② Front cushion ③ Front fork bolt
Fig. 4–1. Steering handle

B. Disassembly

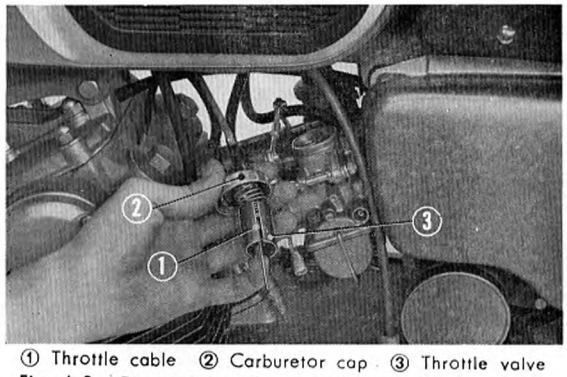
1. To disassemble the brake cable ①, rotate the brake arm ② toward the braking position to provide slack to the cable and then disconnect the brake cable from the brake arm. **(Fig. 4–2)**



① Front brake cable ② Front brake arm
Fig. 4–2. Disassembling the brake cable

2. Disassemble the clutch cable lower end by loosening the screws on the drive chain cover and disconnect the clutch cable end from the clutch lifter.

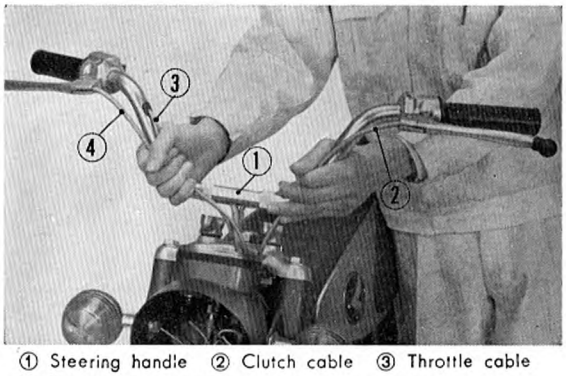
3. Disconnect the lower end of the throttle cable ① by removing the carburetor cap ②, pulling out the throttle valve ③ and then disconnecting the throttle cable from the valve. **(Fig. 4–3)**



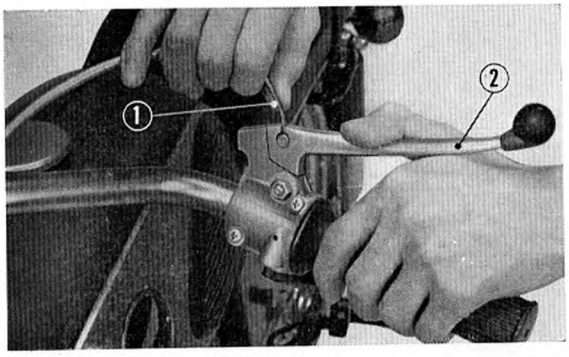
① Throttle cable ② Carburetor cap ③ Throttle valve
Fig. 4–3. Disconnecting the throttle cable from the valve

4. Access to the connectors on the wire harness for disassembly of the electrical equipment is made by removing the head light unit to expose the connectors housed in the headlight case.

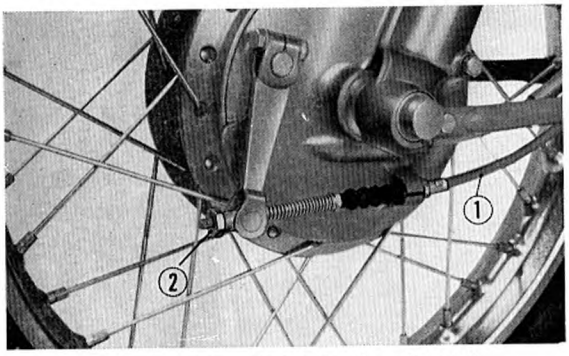
5. Loosen the four handle mounting bolts to remove the steering handle ① from the fork top bridge. The steering handle can be removed together with the cables and wires as a complete unit. **(Fig. 4–4)**



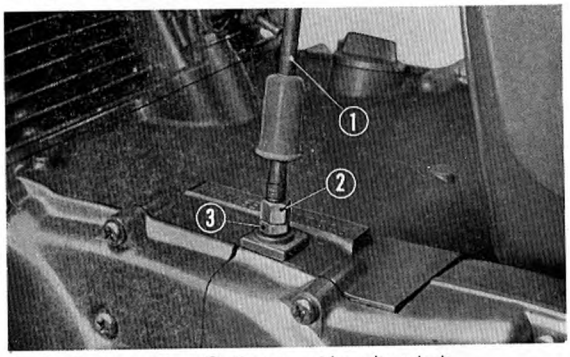
① Steering handle ② Clutch cable ③ Throttle cable
④ Front brake cable
Fig. 4–4. Removing the steering handle



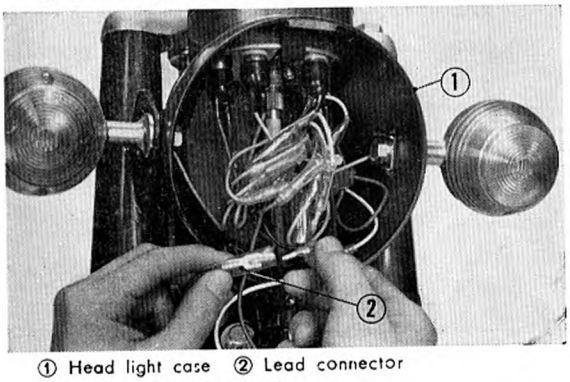
① Clutch cable ② Clutch lever
Fig. 4-5. Disconnecting the clutch cable



① Front brake cable ② Front brake adjust nut
Fig. 4-6. Adjusting the front brake



① Clutch cable ② Clutch cable adjust bolt
③ Clutch cable adjust nut
Fig. 4-7. Adjusting the clutch cable free travel



① Head light case ② Lead connector
Fig. 4-8. Joining the leads

6. Unscrew the brake and clutch cable adjusting bolts and disconnect the inner cable ends from the levers. **(Fig. 4-5)**
7. Disassemble the throttle cable by unscrewing the two screws to separate the light switch assembly. Disconnect the throttle cable from the throttle cable hinge.

C. Inspection

1. Check the brake, clutch and throttle cables for breaks, kinks and unsmoothness of operation.
2. Check the throttle grip pipe to assure smooth operation.
3. Check the levers to assure unrestricted movement.
4. Check the steering handle for twist or bend.

D. Reassembly

1. Assemble the upper ends of the cables to their respective levers.
2. Position the cables and electrical leads in their proper location and then clamp the steering handle in position between the upper and lower handle pipe holder with the four mounting bolts.

   Tightening torque 150~250 kg-cm
   (10.1~18.1 ft•lbs)

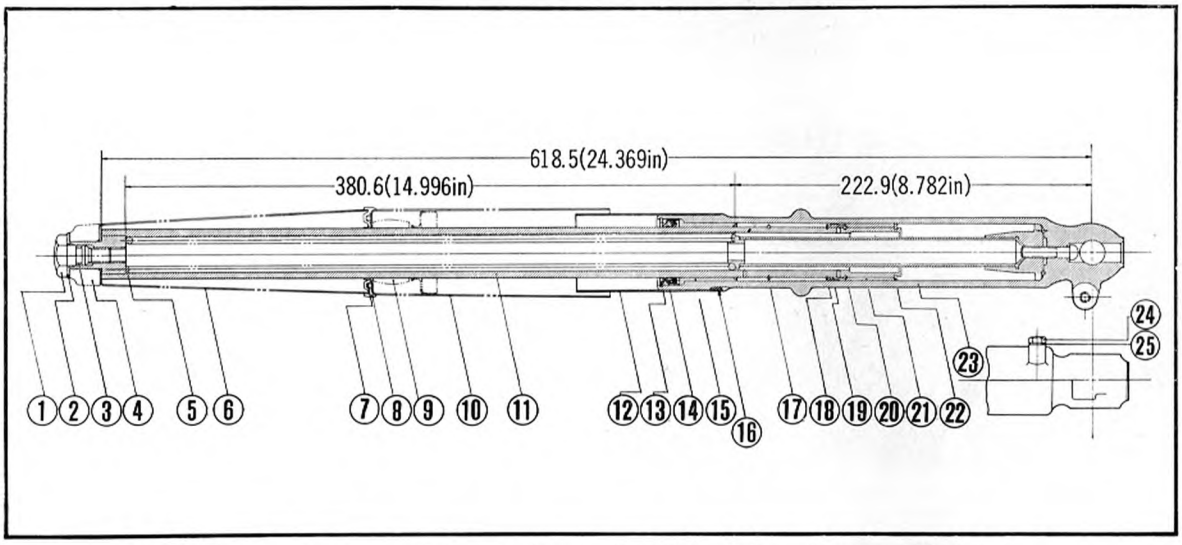
3. Route the cables through the supports and the electrical leads into the headlight case.
4. Connect the clutch cable end to the clutch lifter thread, brake cable end to the brake arm and the throttle cable end to the throttle valve.
5. Adjust the respective cables to the proper specification with the adjuster bolts at both ends of the cable assemblies. Tighten the lock nuts after completing the adjustment. **(Fig. 4-6, 4-7)**
6. Free travel : Throttle cable grip twist angle
   10 degrees
   Front brake cable (lever end)
   20 to 30 mm (0.8 to 1.2 in)
   Clutch cable (lever end)
   20 to 30 mm (0.8 to 1.2 in)
7. Connect all electrical leads within the head light case. Join the leads of the identical color. **(Fig. 4-8)**
8. After the reassembly has been completed, make sure that the cables and electrical leads are not binding or restricting the movement of the front fork by moving the steering handle through the full travel.

4.2 FRONT CUSHION

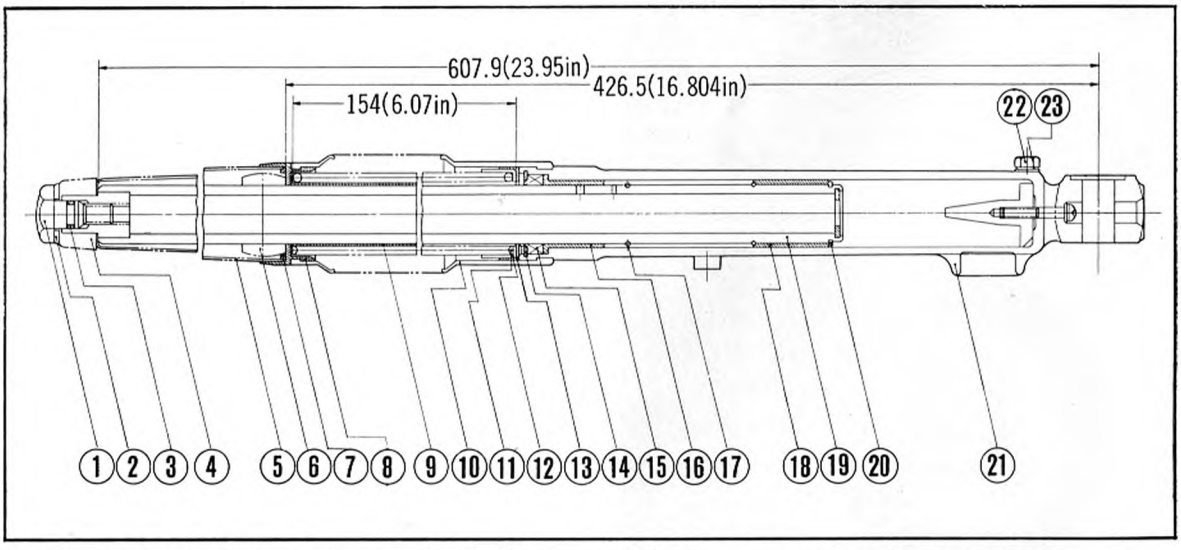
A. Description

The front and rear cushions should not be considered to be functioning independently. The suspension and dampening components directly influence the steering characteristic and stability of the motorcycle. The front fork must not only possess the strength for vertical cushioning but also the horizontal force resulting from the steering function.

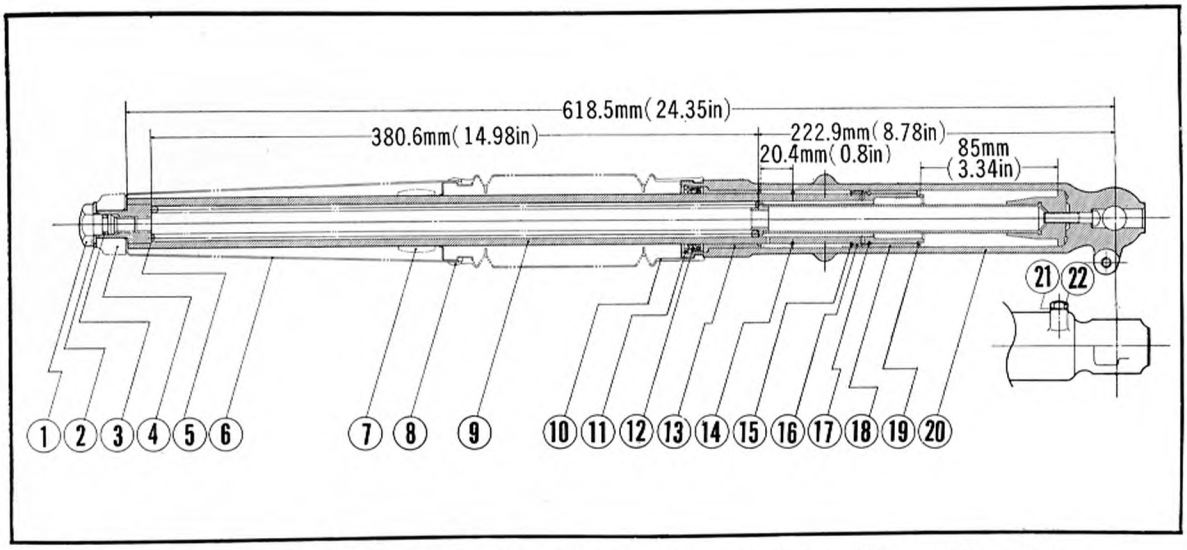
The front cushion spring is designed with two different pitches, this is to provide a broader range of effective cushioning. The hydraulic type damper contains 135~145 cc (8.27~8.88 cu. in) (CD175, CD175A, SS125A, CL125A) [CD125 : 130~135 cc (7.96~8.26 cu. in) hydraulic fluid. **(Fig. 4-9)**



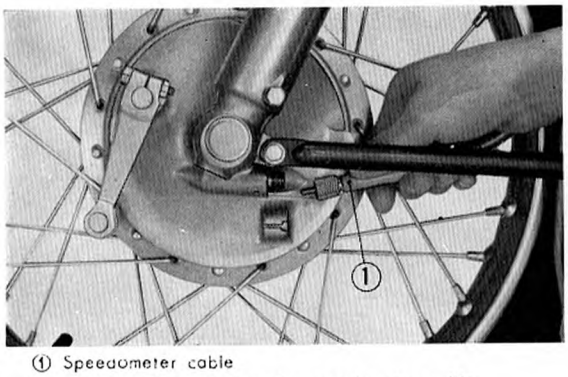
① Front fork bolt ② 13.2×24 washer ③ 8.4×2.4 O ring ④ Fork top bridge ⑤ Front cushion spring
⑥ Front fork upper cover ⑦ Front fork rib packing ⑧ Front fork rib ⑨ Fork bottom bridge ⑩ Front fork under cover
⑪ Front fork pipe complete ⑫ Bottom case cover ⑬ 41mm internal circlip ⑭ Front fork oil seal ⑮ Front fork pipe guide
⑯ Staking ⑰ Fork piston stopper ring ⑱ Fork valve stopper ring ⑲ Front damper valve
⑳ Fork piston stopper ring ㉑ Front fork piston ㉒ Fork piston snap ring ㉓ Front fork bottom case complete
㉔ 6 mm hex. bolt ㉕ Fork drain cock packing **Fig. 4-9A.** Front cushion (CD175/CD175A)



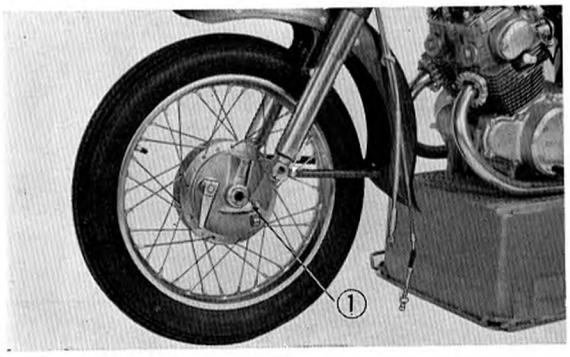
① Front fork bolt ② 13.2×24 washer ③ 8.4×2.4 O ring ④ Fork top bridge ⑤ Front fork upper cover
⑥ Fork bottom bridge ⑦ Fork cover lower seat packing ⑧ Fork cover lower seat ⑨ Front cushion spring guide
⑩ Front fork boot ⑪ Front cushion spring ⑫ Front cushion spring under guide ⑬ Front cushion spring under seat
⑭ 37 mm internal circlip ⑮ Front fork oil seal ⑯ Front fork pipe guide ⑰ Piston stopper ring ⑱ Front fork piston
⑲ Front fork pipe complete ⑳ Front fork piston snap ring ㉑ Front fork bottom case complete ㉒ 6×8 hex bolt
㉓ Fork drain cock packing **Fig. 4-9B.** Front cushion (CD125A)



① Front fork bolt ② Front fork washer ③ 8.4×2.4 O ring ④ Fork top bridge ⑤ Front cushion spring
⑥ Front fork cover ⑦ Fork bottom bridge ⑧ Front fork rib ⑨ Front fork pipe comp. ⑩ Front fork boot
⑪ 41 mm internal circlip ⑫ Front fork oil seal ⑬ Front fork pipe guide ⑭ Fork piston stopper ring
⑮ Fork valve stopper ring ⑯ Front damper valve ⑰ Fork piston stopper ring ⑱ Front fork piston
⑲ Fork piston snap ring ⑳ Front fork bottom case ㉑ Fork drain cock packing ㉒ 6 mm hex. bolt
Fig. 4-9-C. Front cushion (SS125A, CL125A)



① Speedometer cable
Fig. 4-10. Disconnecting the speedometer cable

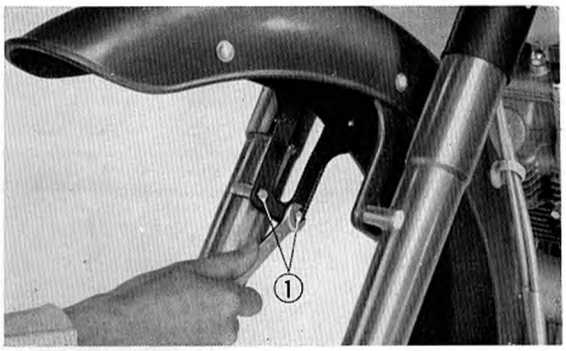


① Front wheel
Fig. 4-11. Removing the front wheel

B. Disassembly

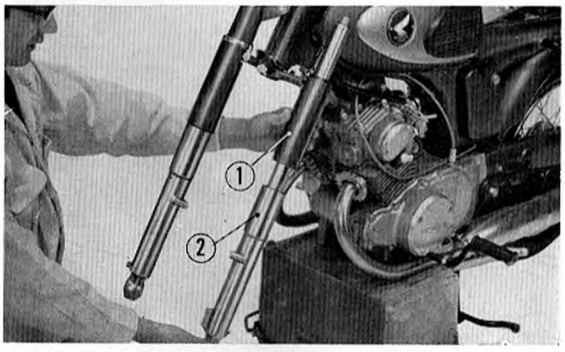
1. Remove the steering handle in accordance with section 4.1 B.
2. Disconnect the speedometer cable ① at the speedometer gear box. **(Fig. 4-10)**
3. Place a block under the engine to raise the front wheel off the ground. Loosen the front axle nut and pull out the axle, the front wheel ① will disengage from the front fork. **(Fig. 4-11)**

4. Remove the front fender by unscrewing the 6×14 bolts attaching the fender brackets to the fork. **(Fig. 4-12)**

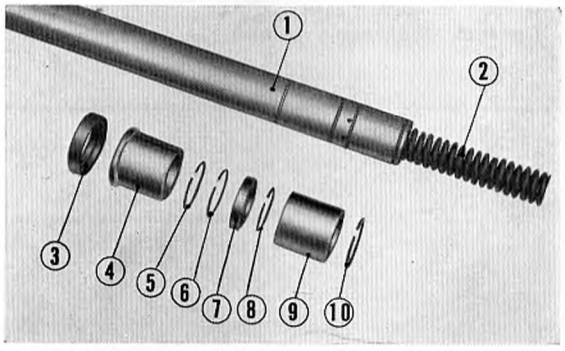


① 6×14 hex bolt
Fig. 4-12. Removing the front fender

5. Unscrew the head light case mounting bolts attaching the head light assembly to the front fork.
6. Remove the two front fork bolts and 8×43 hex bolts, slide the front fork assemblies out the bottom. **(Fig. 4-13)**
7. Drain the oil in the strut by removing the drain plug before disassembly of the lower cylinder.
8. Remove the 41mm internal circlip using the snap ring plier and pull out the front fork pipe from the front fork bottom case.
9. Remove the piston snap ring and the front fork piston can be removed. **(Fig. 4-14)**



① Front fork under cover ② Front fork assembly
Fig. 4-13. Sliding out the front fork assembly



① Front fork pipe ② Front cushion spring
③ Front fork oil seal ④ Front fork pipe guide
⑤ Piston stopper ring ⑥ Fork valve stopper ring
⑦ Front damper valve ⑧ Piston stopper ring
⑨ Front fork piston ⑩ Fork piston snap ring
Fig. 4-14. Removing the fork piston

C. Inspection

1. Cushion spring

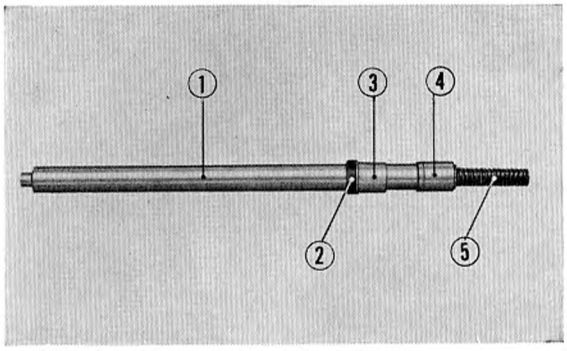
Model	Item	Standard Value	Serviceable Limit
CD175A	Free length	413.4 mm (16.276 in)	Replace if under 382 mm (15.04 in)
	Loading	380.6 mm/18 kg (14.98 in/39.6 lbs)	
	Tilt	Within 0.5°	
CD125A	Free length	189.0 mm (7.441 in)	Replace if under 175 mm (6.90 in)
	Loading	106.5 mm/40 kg (4.193 in/88 lbs)	
	Tilt	Within 1.5°	
CL125A SS125A	Free length	418.4 mm (16.47 in)	Replace if under 388 mm (15.03 in)
	Loading	295.6 mm/65 kg (11.64 in/143 lbs)	
	Tilt	Within 1.5°	

2. Front fork piston

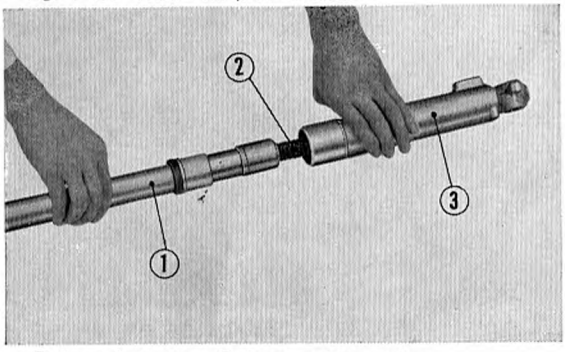
Item	Standard Value	Serviceable Limit
Outer dia	34.425~34.45 mm (1.3553~1.3563 in)	Replace if under 34.415 mm (1.3549 in)
Out of round	Within 0.02 mm (0.0008 in)	Replace if over 0.04 mm (0.0016 in)
Taper	Within 0.02 mm (0.0008 in)	Replace if over 0.04 mm (0.0016 in)

3. Front fork bottom case

Item	Standard Value	Serviceable Limit
Inner diameter	35.53~35.57 mm (1.3988~1.4004 in)	Replace if over 35.72 mm (1.4063 in)
Out of round	Within 0.02 mm (0.0008 in)	Replace if over 0.04 mm (0.0016 in)
Taper	Within 0.02 mm (0.0008 in)	Replace if over 0.04 mm (0.0016 in)



① Front fork pipe ② Front fork oil seal
③ Front fork pipe guide ④ Front fork piston
⑤ Front cushion spring
Fig. 4-15. Front fork pipe assembly



① Front fork pipe ② Front cushion spring
③ Front fork bottom case
Fig. 4-16. Reassembling the front cushion

D. Reassembly

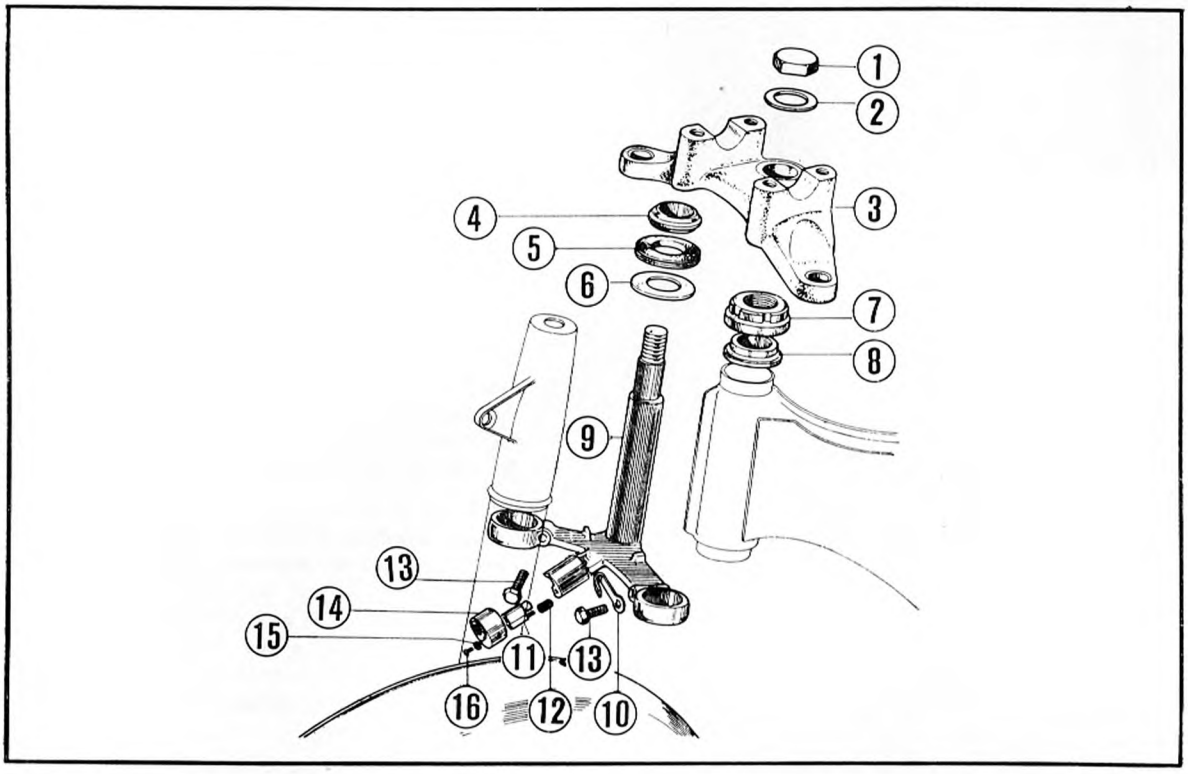
1. Assemble the fork pipe guide, damper valve and piston, and set the each ring to specified position. **(Fig. 4-15)**

   Assemble the front fork pipe assembly ① into the fork bottom case ③ and drive the front fork oil seal using the front oil seal driving guide (Tool No. 07054-23003) and weight (Tool No. 07054-21602) not to damage and set the internal circlip completely. **(Fig. 4-16)**
2. Fill the fork with SAE10W30 135~145 cc hydraulic fluid (CD125/A 130~135 cc).
3. After completing the assembly, install the fork into the steering stem.
4. Assemble the front fork to the top bridge.
5. Assemble the handle bar to the top bridge in accordance with section 4.1 D.
6. Install the head light case, connect the electrical leads within the case and then assemble the light unit.
7. Install the front fender on the front fork.
8. Assemble the front wheel to the front fork.
9. Connect the speedometer cable to the gear box and connect the front brake cable and complete the adjustment.
10. Connect and adjust the throttle cable.

4.3 STEERING STEM AND STEERING HANDLE LOCK

A. Construction

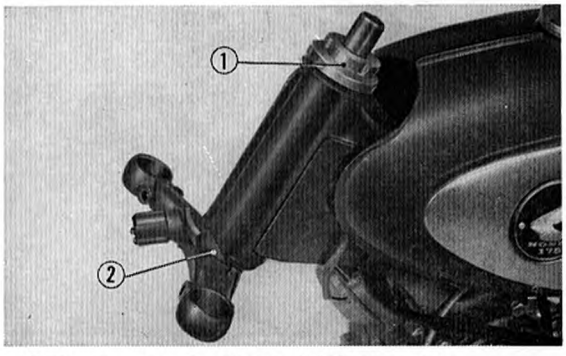
The steering stem is mounted by bolts to the front fork through the top bridge plate and supported by upper and lower sets of ball bearings in the steering head on which it pivots. **(Fig. 4-17)**



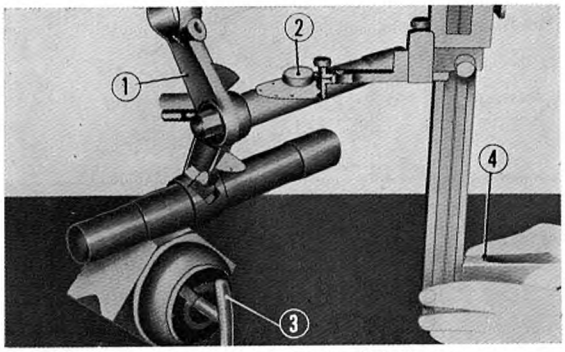
① Steering stem nut ② Steering stem nut washer ③ Fork top bridge ④ Steering bottom cone race
⑤ Steering head dust seal ⑥ Steering head dust seal washer ⑦ Steering head top thread ⑧ Steering top cone race
⑨ Steering stem ⑩ Wire clip ⑪ Steering handle lock ⑫ Handle lock spring ⑬ 8×43 hex bolt
⑭ Handle lock case cover ⑮ 3 mm flat washer ⑯ 3×10 cross screw
Fig. 4-17. Sectional view of steering stem

B. Disassembly

1. Separate the steering handle pipe in accordance with section 4.1 B.
2. Remove the front cushion in accordance with section 4.2 B.
3. Remove the steering stem top thread and draw the steering stem out of the head pipe, being careful not to drop the steel balls. **(Fig. 4-18)**



① Steering stem top thread ② Steering stem
Fig. 4-18. Removing the steering stem



① Complete steering stem ② Small dial gauge
③ Magnetic V-block ④ Height gauge
Fig. 4-19. Checking the steering stem for bend

C. Inspection

1. Inspect steel balls for cracks, wear and other damages.
2. Inspect the cone and ball races of both the top and bottom for any wear or damages.
3. Inspect the steering head dust seal for wear and damage.
4. Inspect the steering stem for twist and bend. **(Fig. 4-19)**
5. Inspect the thread end of the steering stem for damaged threads.
6. Inspect the steering handle lock spring for breakage.

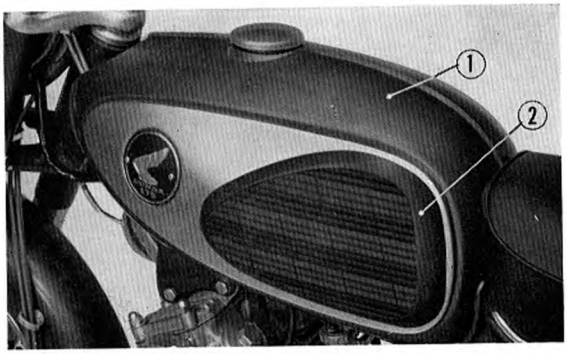
D. Reassembly

1. Mount the steering handle lock on the steering stem.
2. Mix the #8 steel balls (36) in grease and lay into the lower and upper ball race and carefully insert the stem to prevent dropping the balls. Tighten the steering head top thread.

(Note)

Special attention is required to tighten the top thread. It must be tightened in conjunction with the steering stem nut and the front fork bolt. When the stem nut is properly tightened, the front wheel should turn to the lock under its own weight when a slight force is applied. Further there should not be any looseness in the vertical or the horizontal directions.

3. Assemble the front cushion and front wheel.
4. Install the steering handle.



① Fuel tank ② Knee grip rubber
Fig. 4-20. Fuel tank

4.4 FUEL TANK

A. Construction

The fuel tank ① is placed on the frame body directly above the engine and is installed on the frame body through the fuel tank cushion. The knee grip rubber ②, as well as the tank mark, fitted with the tank side cover, are installed on the fuel tank. **(Fig. 4-20)**

B. Disassembly

1. Loosen the two seat setting bolts and remove it.
2. Position the fuel cock lever ① to STOP and remove the fuel tube ② from the carburetor. **(Fig. 4-21)**
3. Remove the fuel tank rear brace, then the tank may be removed.
4. To remove the fuel tank, pull it upward toward the rear and exercise care so as not to hit the fuel cock.
5. After the emblem ④ is removed, the 6×8 hex. bolt ⑤ is loosened, and the side cover ② is pushed forward, the side cover can be removed. **(Fig. 4-22)** (CD175/CD175A, CD125/CD125A).
6. To remove the fuel cock, unscrew the fuel strainer cup, O ring and fuel strainer screen and unscrew the mounting screw.

C. Inspection

1. Inspect the fuel tank for leaks.

(Caution)

Normally a test is performed by the water pressure. However, exercise precaution since excessive pressure will cause rupture at the tank seam.

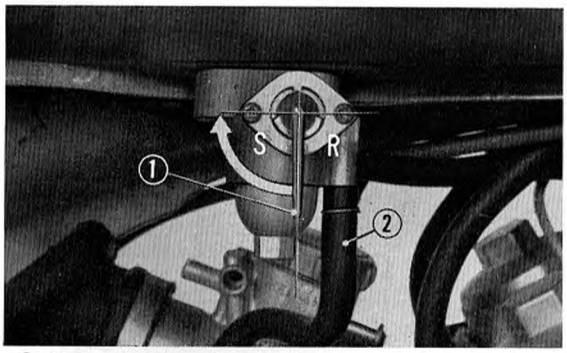
2. Check for clogging of the filler cap vent hole.
3. Check for damage to the front and rear cushion rubbers.
4. Check for damage to the valve cock O ring, the filler cap gasket.
5. Check for break or damage.

D. Reassembly

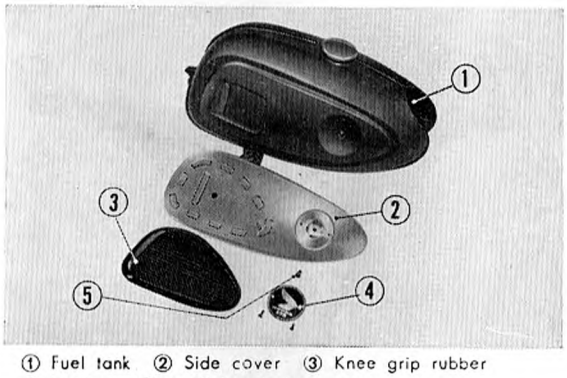
1. Install the fuel cock.
2. Install the side cover. **(Fig. 4-23)** (CD175/CD175A, CD125/CD125A)

(Caution)

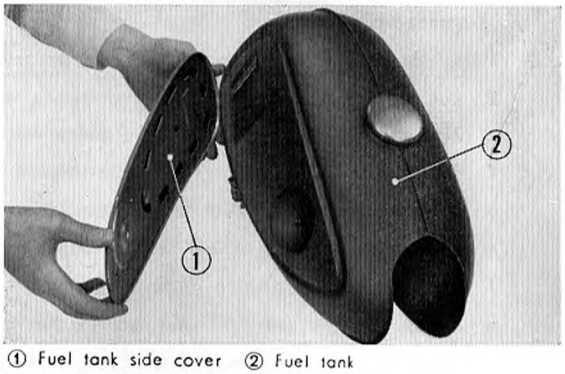
The side cover is hooked to the rear of the tank and the forward end is attached to the tank by bolt; make sure that the bolt is of the proper length to prevent puncturing the tank. **(Fig. 4-24)**



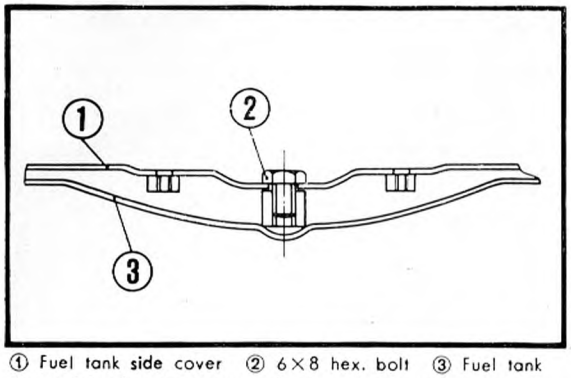
① Fuel cock lever ② Fuel tube
Fig. 4-21. Removing the fuel tube



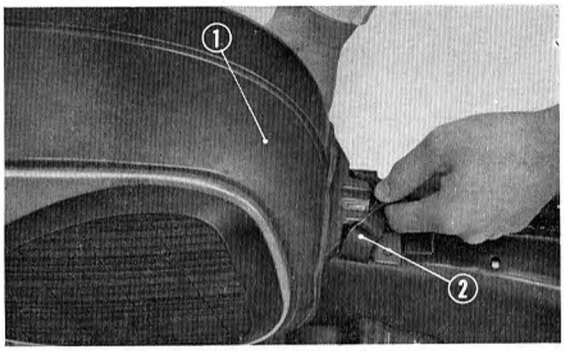
① Fuel tank ② Side cover ③ Knee grip rubber
④ Emblem ⑤ 6×8 hex bolt
Fig. 4-22. Fuel tank assembly



① Fuel tank side cover ② Fuel tank
Fig. 4-23. Installing the side cover



① Fuel tank side cover ② 6×8 hex. bolt ③ Fuel tank
Fig. 4-24. Sectional view of side cover retaining screw



① Fuel tank ② Fuel tank rear cushion
Fig. 4-25. Pushing the fuel tank from the rear

3. Fit the front and rear rubber cushions to the frame body. The front rubber cushion should be inserted by pushing the fuel tank from the rear. Install the fuel tank rear end by placing it under the rear frame. **(Fig. 4-25)**
4. Fit the fuel line to the carburetor and secure it by the clips.

4.5 FRAME BODY

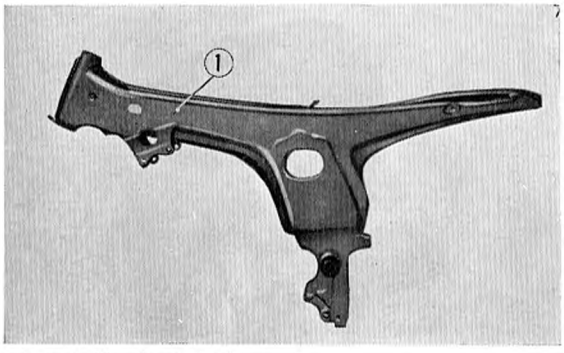


Fig. 4-26. Frame body

A. Construction

The frame body is the main structural member araund which the motorcycle is assembled. It mounts the engine and is supported on the front and rear wheels. The frame is made strong to support the weight of the engine, rider and carrier load and in addition, it must be substantial to receive the dynamic reaction imposed by the road and riding conditions under the load.

The frame must be rigid to provide good steering characteristic and at the same time lightness is desirable for ease in handling and for good riding performance. **(Fig. 4-26)**

B. Disassembly

1. Remove the engine from the frame in accordance with Section 3.1 B.
2. Remove the steering handle in accordance with Section 4.1 B.
3. Remove the front cushion in accordance with Section 4.2 B.
4. Disassemble the steering tem in accordance with Section 4.3 B.
5. Remove the seat and fuel tank in accordance with Section 4.4 B.
6. Disassemble the rear wheel in accordance with Section 4.13 B.
7. Remove the rear cushion in accordance with Section 4.11 B.
8. Disassemble the rear fork and rear fender in accordance with Section 4.9 B.
9. Remove the air cleaner and tool box in accordance with Section 4.6 B.
10. Detach all electrical components from the frame.
11. Remove the stand in accordance with Section 4.7 B.

C. Inspection

1. Inspect the weld joints for any breaks or cracks.
2. Inspect the steering head pipe for twist, bends and misalignment.
3. Inspect the top and bottom steering head ball races for signs of wear and scratches.

(Note)

The ball races should be fitted to the steering head pipe with light driving (0.01～0.05 and must be bottomed so that it is not cocked.

4. Inspect the frame paint coating for any chips and rust stops.

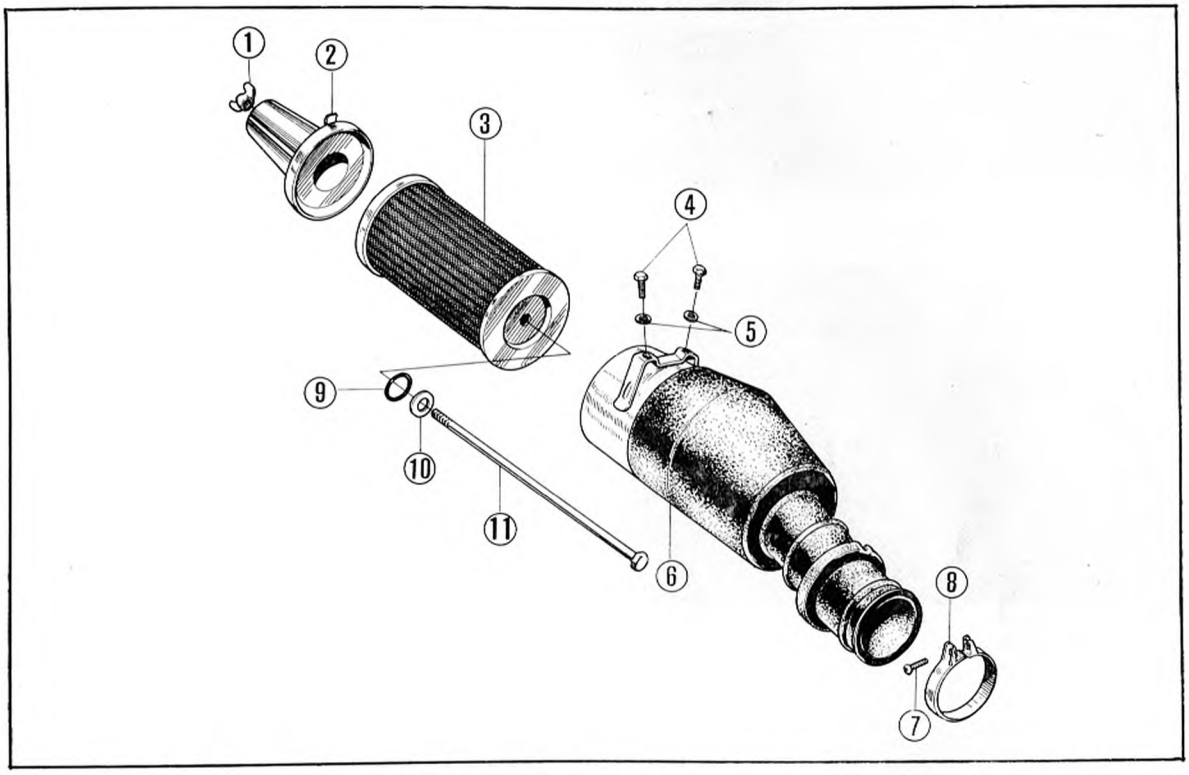
D. Reassembly

Perform the assembly in the reverse order of disassembly.

4.6 AIR CLEANER CASE AND SEAT

A. Construction

The air cleaner is located under the seat and is accessible by removing the seat. The cleaner element is made of corrugated paper material for greater filtering effect. **(Fig. 4–27)**



① Air cleaner nut ② Air intake pipe ③ Air cleaner element ④ 6×12 hex., bolt ⑤ 6 mm flat washer
⑥ Air cleaner case ⑦ 4×16 cross screw ⑧ Connecting tube band A ⑨ 5 mm O ring ⑩ 5 mm flat washer
⑪ Air cleaner bolt

Fig. 4–27. Air cleaner

The motorcycle is equipped with a double seat consisting of sponge padding and vinyl leather covering. A hand-hold strap is installed across the seat. **(Fig. 4–28)**

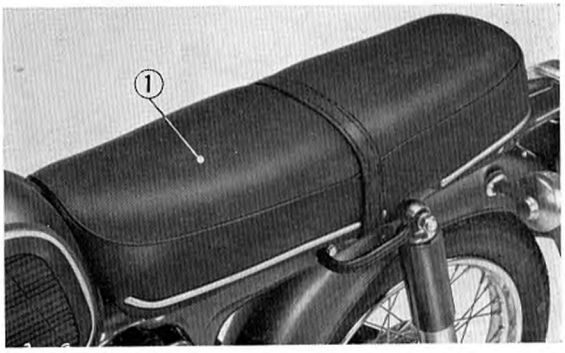
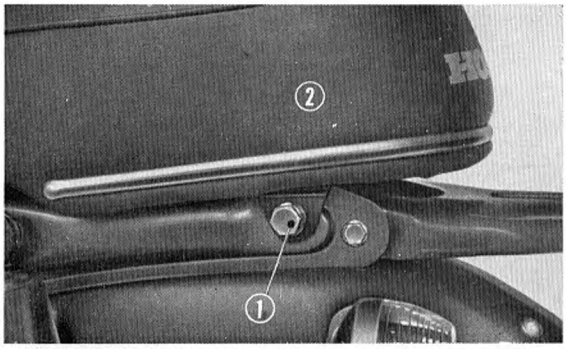


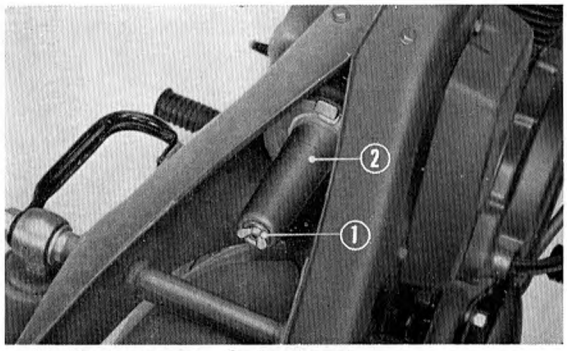
Fig. 4.28 Seat



① 8×22 hex bolt ②
Fig. 4-29. Seat mounting bolt

B. Disassembly

1. Loosen the two 8×22 seat mounting bolts ①, then separate the seat ② from the frame by pulling it toward the rear. **(Fig. 4-29)**



① Air cleaner nut ② Air cleaner
Fig. 4-30. Removing air cleaner

2. With the seat removed, the air cleaner is easily accessible by pulling it toward the rear.
3. Remove the air cleaner wing nut ① and the air cleaner ② can be separated into two parts. **(Fig. 4-30)**

C. Inspection

1. Inspect the seat covering for wear, cracks and tear.
2. Air cleaner which is clogged with dust should be cleaned with dry compressed air or lightly brushing.
3. Inspection filter element for tear or other defects.

D. Reassembly

1. Install the air cleaner.
2. After the seat is fitted, assure that the front end is properly hooked, and then install the seat mounting bolts.

4.7 STAND

A. Construction

For reducing weight, a bent pipe is used for the stand. The section which contacts the ground when the stand is erected has an oval plate welded to increase the contact area. **(Fig. 4-31)**

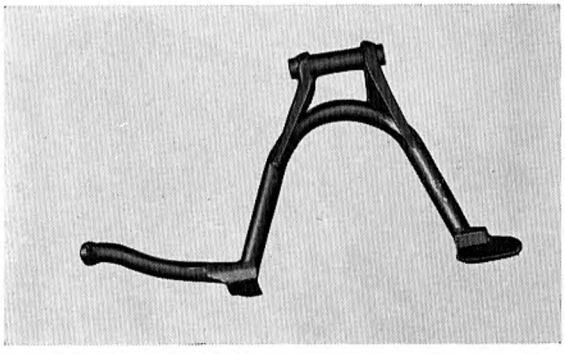


Fig. 4-31. Main Stand

The step bar is mounted under the crankcase with four of 8×25 hex bolts.

B. Disassembly

[CD175/CD175A]

1. Remove the muffler in accordance with section 3.1 B and then detach the step bar.
2. Loosen the two 6 mm nuts from the stand and remove the brake pedal return spring and stop light spring.
3. Place a support block under the engine, loosen the nut on the end of the stand pivot shaft and by drawing out the pivot shaft, the stand can be removed from the frame. **(Fig. 4-32)**

[SS125A/CL125A]

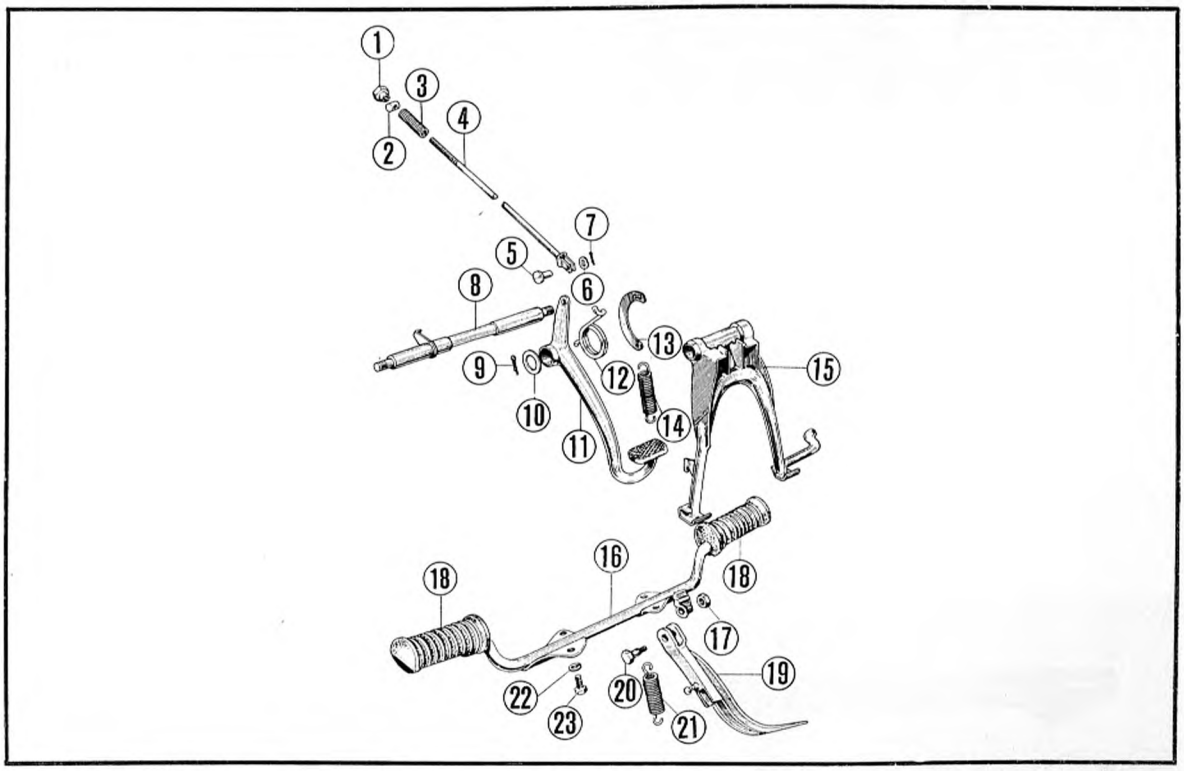
1. Remove the muffler.
2. Remove the 3.0 mm cotter pin on the right end of the main stand pivot shaft, the brake pedal and stop light spring.
3. Place a support block under the engine, and by drawing the main stand pivot shaft, the stand can be separated from the frame.

C. Inspection

Inspect the stand and step bar for bend; the pad on the step bar should also be inspected for wear.

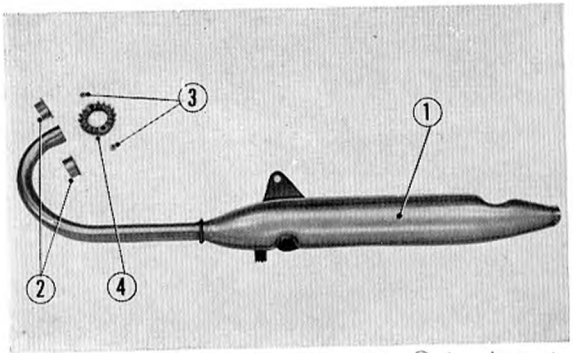
D. Reassembly

Perform the assembly in the reverse order of disassembly.



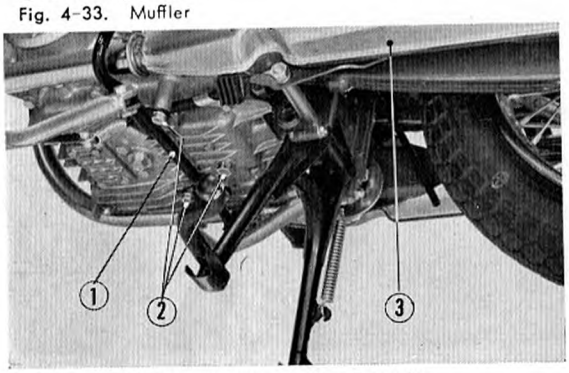
① Rear brake adjust nut ② Rear brake arm joint ③ Rear brake rod spring ④ Rear brake rod ⑤ Brake rod joint pin ⑥ 6 mm flat washer ⑦ 2.0×15 cotter pin ⑧ Main stand pivot pipe ⑨ 3.0×25 cotter pin ⑩ 19 mm washer ⑪ Brake pedal ⑫ Brake pedal spring ⑬ Main stand spring hook ⑭ Main stand spring ⑮ Main stand ⑯ Step bar ⑰ 10 mm thin nut ⑱ Step rubber ⑲ Side stand bar ⑳ Side stand pivot screw ㉑ Side stand spring ㉒ 8 mm spring washer ㉓ 8×25 hex bolt

Fig. 4-32. Main stand (CD175/CD175A).



① Muffler ② Exhaust pipe joint collar ③ 6mm hex nut ④ Exhaust pipe joint

Fig. 4-33. Muffler



① Step ② Step mounting bolt ③ Muffler

Fig. 4-34. Removing the step mounting bolt

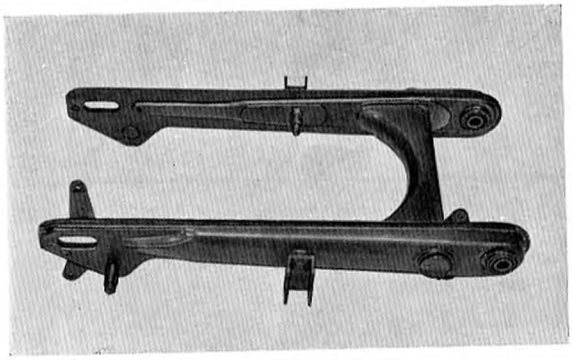


Fig. 4-35. Rear fork

4.8 MUFFLER AND EXHAUST PIPE

A. Construction

The muffler and the exhaust pipe have been made into an integral welded unit to greatly improve the silencing effectiveness of the muffler, in addition, it also facilitates the replacement of the muffler.

The length and bend in the exhaust pipe, and the volume of the muffler will have a great effect on the engine power output. The exhaust gases noise is reduced as it is routed through the narrow passages in the muffler ① the remaining noise is diffused by the diffuser pipe to assure greater silencing effectiveness of the muffler. **(Fig. 4-33)**

B. Disassembly

〔CD175/CD175A〕

1. Remove the exhaust pipe joint nuts.
2. The muffler is bolted to the frame together with the step ①, therefore, loosening the step mounting bolts ② will also separate the muffler ③ from the frame. **(Fig. 4-34)** (CD175/CD175A)

〔SS125A〕

1. Remove the exhaust pipe joint nuts.
2. Remove the 10 mm hex nut and 8×70 hex bolt, the muffler can be separated from the frame.

〔CL125A〕

1. Remove the exhaust pipe joint nuts.
2. The muffler is bolted to the frame together with the seat setting bolt (8×22 hex bolt) and the side grip setting bolt (6×20 hex bolt), therefore, loosening these bolts will also separate the muffler from the frame.

C. Inspection

1. Inspect the muffler gasket for damage.
2. Inspect the muffler for cracks, dents and other defects.

D. Reassembly

Perform the assembly in the reverse order of disassembly.

(Note)

First install the exhaust pipe joint but do not tighten as it will make the installation of the other muffler mounting bolts difficult. The tightening of the exhaust pipe joint nuts should be made last.

4.9 REAR FORK AND REAR FENDER

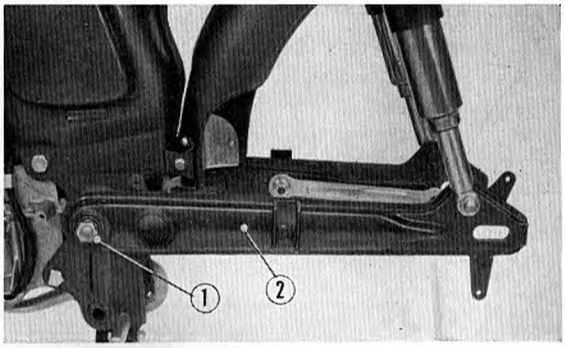
A. Construction

One end of the rear fork is fitted to a section of the frame and the other end is fitted to the frame through the rear cushion. When the rear wheel bounces, the section which is fitted to the frame becomes the pivot axis and the rear wheel moves in an arc. **(Fig. 4-35)**

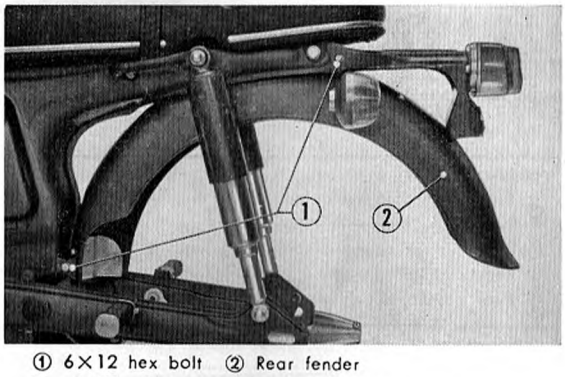
The close proximity of the pivot axis to the drive sprocket poses negligible effect on the chain tension.

B. Disassembly

1. Remove the four 6×8 hex bolts to separate the chain case from the frame. (CD175/CD175A, CD 125/CD125A). Remove the three 6×8 hex, bolts and the chain case (SS125A/CL125A).
2. Remove the rear wheel in accordance with section 4.12 B.
3. Remove the rear cushions in accordance with section 4.10 B.
4. Remove the rear fork pivot bolt ① to separate the rear fork ② from the frame. **(Fig. 4-36)**
5. Drive out the rear fork center collar and the rear fork pivot rubber bushing.
6. Loosen the four 6×12 bolts to separate the rear fender from the frame. **(Fig. 4-37)**



① Rear fork pivot bolt ② Rear fork
Fig. 4-36. Removing the rear fork



① 6×12 hex bolt ② Rear fender
Fig. 4-37. Separating the rear fender

C. Inspection

1. Rear pivot bushing bore

Item	Standard Value	Serviceable Limit
Bore	12.1～12.3 mm (0.476～0.485 in)	Replace if over 12.45 mm (0.491 in)

2. Rear fork pivot bolt

Item	Standard Value	Serviceable Limit
Outside diameter	12.0 mm (0.472 in)	
Bend	0.02 Max (0.008 in)	Replace if over 0.05 mm (0.002 in)

3. Rear fork

Item	Standard Value	Serviceable Limit
Twist	0.1 Max (0.004 in)	

(Note)

Measurement should be made with the rear fork pivot bushing and the center collar inserted into the rear fork.

5. Inspect the rear fender and the drive chain case for dents and other defects.
6. Check the chain for stretch.

D. Reassembly

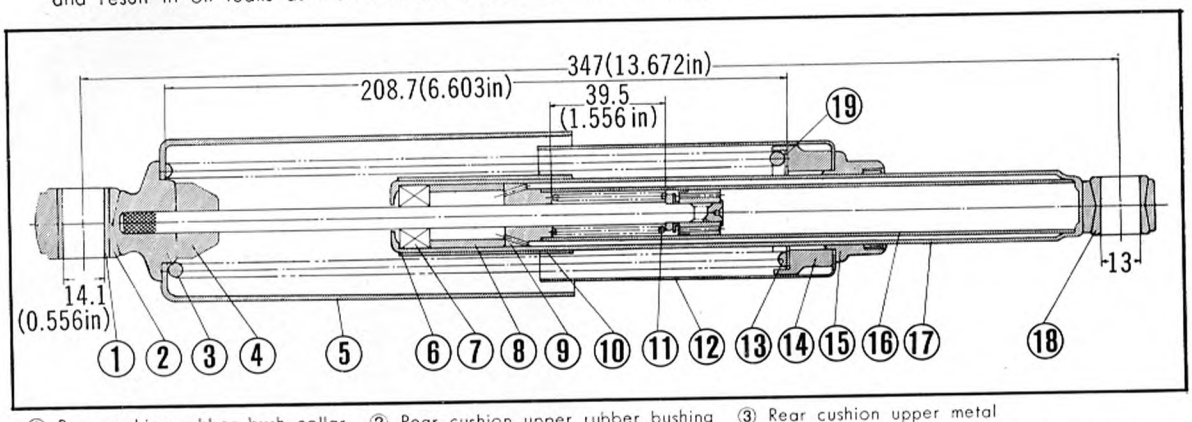
1. Install the rear fender.
2. Drive in the pivot bushing and the center collar. Insert the rear fork seal cap.
3. Insert the pivot bolt through the side bracket and assemble the rear fork to the frame.
4. Install the rear cushion.
5. Install the rear wheel.
6. Install the drive chain.
7. When the assembly is completed, adjust the rear brake pedal and the chain tension.
8. Install the drive chain case.

4.10 REAR CUSHION

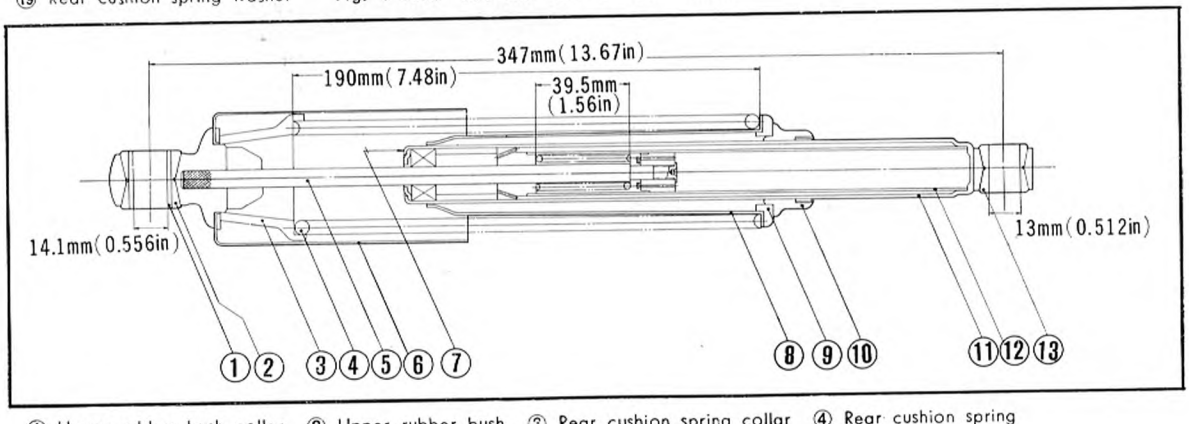
A. Construction

The rear cushion is of a telescoping type utilizing the spring to absorb the compressive force, with an oil damper taking up the reacting load to perform the damping function. (Fig. 4-38A)

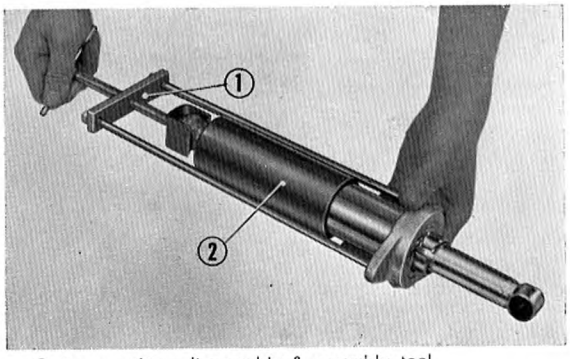
The damper contains 47 cc of #60 spindle oil. Improper amount of oil will reduce the cushioning stroke, and result in oil leaks as well as noise caused by the bottoming piston.



① Rear cushion rubber bush collar ② Rear cushion upper rubber bushing ③ Rear cushion upper metal
④ Rear cushion stopper rubber ⑤ Rear cushion upper case ⑥ Rear cushion seal retainer ⑦ Rear cushion oil seal
⑧ Rear cushion damper collar ⑨ Rear cushion rod guide ⑩ Rear cushion spring guide
⑪ Rear cushion rebound stopper spring ⑫ Rear cushion under case ⑬ Rear cushion spring ⑭ Rear cushion spring collar
⑮ Rear cushion spring seal ⑯ Rear cushion inner pipe ⑰ Rear cushion bottom case ⑱ Rear cushion lower rubber bushing
⑲ Rear cushion spring washer **Fig. 4-38A.** Sectional view of rear cushion



① Upper rubber bush collar ② Upper rubber bush ③ Rear cushion spring collar ④ Rear cushion spring
⑤ Rear damper piston rod comp. ⑥ Rear cushion upper case ⑦ Staking ⑧ Rear cushion spring guide
⑨ Rear cushion spring washer ⑩ Rear cushion spring seat ⑪ Rear cushion bottom case ⑫ Rear cushion inner pipe
⑬ Rear cushion lower rubber bush
Fig. 4-38B. Sectional view of rear cushion (SS125A/CL125A)



① Rear cushion disassembly & assembly tool
② Rear cushion
Fig. 4-38B. Disassembling the rear cushion

B. Disassembly

1. Loosen the two 10 mm cap nuts and remove the rear cushion assembly.
2. Compress the rear cushion upper case, by using cushion assembly and disassembly tool (Tool No. 07035-23701), remove the rear cushion seat, lift off the upper case and then remove the cushion spring.

C. Inspection

1. Rear cushion spring

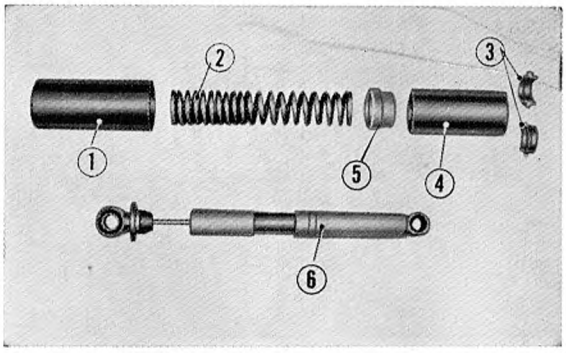
Item	Standard Value	Serviceable Limit
Free length	222 mm (8.74 in)	Replace if under 196 mm (7.72 in)
Tension	(190 mm/45.5~50.5 kg 7.48 in/100~111 lbs)	
	155 mm/121.0~136.2 kg (6.1 in/267~300 lbs)	
Tilt	1.5° Max	

Item		Standard Value	Serviceable Limit
SS125A CL125A	Free length	203.3 mm (8.0 in)	Replace if under 180 mm (7.08 in)
	Tension	128 mm/105 kg (5.039 in/330 lbs)	
	Tilt	1.5° max	

2. Inspect for cushion oil leak.
3. Inspect for damage to cushion spring seat.

D. Reassembly

Perform the reassembly in the reverse order of disassembly.



① Upper case ② Rear cushion spring
③ Rear cushion spring seat ④ Under case
⑤ Rear cushion spring coller ⑥ Upper metal complete
Fig. 4-39. Assembling the rear cushion

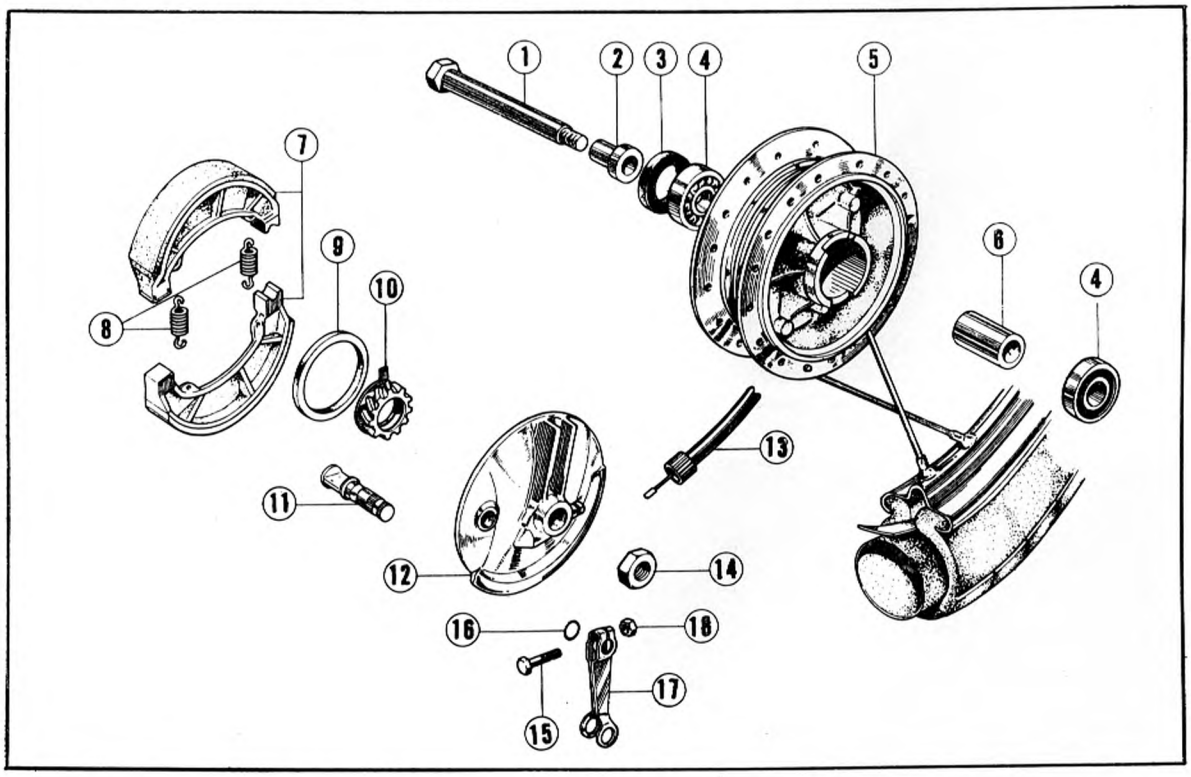
(Note)

a. The spring is made with two different types of pitch, the end with the smaller pitch must be toward the bottom.
b. To facilitate the installation of the spring seat stopper, extend the cushion until the stopper can be inserted.

4.11 FRONT WHEEL

A. Construction

The aluminum hub contains the brake assembly, front axle distance collar and bearing enclosed by the front brake panel. The slot on the brake panel fits the cushion to prevent the panel from rotating. **(Fig. 4-40)**



① Front wheel axle ② Front wheel side collar ③ 26427 oil seal ④ 6302Z ball bearing ⑤ Front wheel hub
⑥ Front axle distance collar ⑦ Brake shoe ⑧ Brake shoe spring ⑨ 54667 oil seal ⑩ Speedometer gear ⑪ Brake cam
⑫ Front brake panel ⑬ Speedometer cable ⑭ Axle nut ⑮ 6×22 hex bolt ⑯ Brake cam dust seal ⑰ Brake arm
⑱ 6 mm hex nut
Fig. 4-40. Front wheel

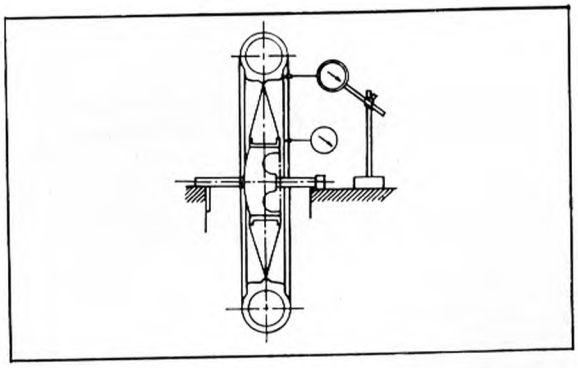
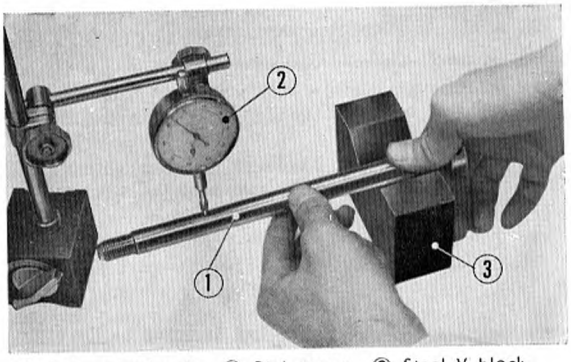


Fig. 4-41. Checking the front wheel rim for runout



① Front wheel axle ② Dial gauge ③ Steel V block
Fig. 4-42. Checking the front axle for bend

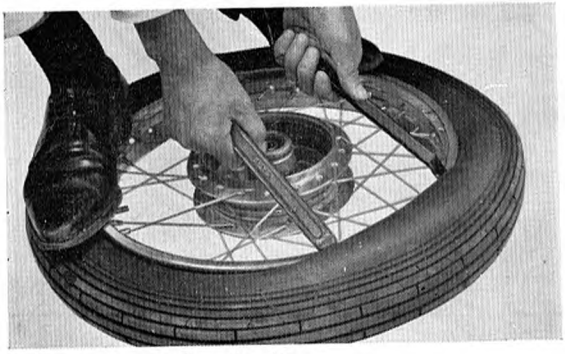


Fig. 4-43. Installing the tire

B. Disassembly

1. Place a suitable support block under the engine to raise the front wheel off the ground.
2. Disconnect the brake cable.
3. Disconnect the speedometer cable from the speedometer gear box.
4. Loosen the front axle nut and the wheel will drop off when the axle is drawn out.
5. Remove the panel, bearing retainer, two 6302 Z ball bearings, front axle spacing collar and disassemble the front wheel hub.
6. The brake shoes can be removed from the panel by spreading the shoe apart by hand.
7. Separate the tire and tube from the rim with a tire iron.

C. Inspection

1. Rim runout. **(Fig. 4-41)**

Item	Standard Value	Serviceable Limit
Side runout	0.5 mm Max (0.02 in)	Replace or repair if over 3.0 mm (0.118 in)
Vertical runout	0.5 mm Max (0.02 in)	Replace or repair if over 3.0 mm (0.118 in)

2. Axle bend and wear. **(Fig. 4-42)**

Item	Standard Value	Serviceable Limit
Outside diameter	14.957~14.984 mm (0.598~0.599 in)	Replace if under 14.95 mm (0.588 in)
Bend	0.01 Max (0.0004 in)	Replace if over 0.15 mm (0.0059 in)

3. 6302 Z ball bearings axial and radial clearance.

Item	Standard Valve	Serviceable Limit
Axial clearance	0.05 mm Max (0.002 in)	Replace if over 0.1 mm (0.004 in)
Radial clearance	0.002~0.007 mm (0.0008~0.0014 in)	Replace if over 0.05 mm (0.002 in)

4. Front brake shoe diameter and lining thickness.

Item	Standard Value	Serviceable Limit
Diameter	139.3~139.5 mm (5.4842~5.4921 in)	
Lining thikness	4.5~4.8 mm (0.177~0.189 in)	

5. Front brake cam thickness.

Item	Standard Value	Serviceable Limit
Thickness	6 mm (0.236 in)	

6. Inspect and tighten any loose spokes.
7. Check for air leak by submerging the tube in water.
8. Check the tire for damage to casing.

D. Reassembly

1. The tube can be easily mounted by inflating with small amount of air to make the tube firm. **(Fig. 4-43)**

(Note)

(a) After mounting the tire, inflate with approximately 1/3 the designated pressure and lightly tap around the tire with a wooden hammer to eliminate any pinching of the tube. **(Fig. 4-44)**

(b) The valve stem should be positioned pointing toward the axle to prevent damage to the tube. **(Fig. 4-45)**

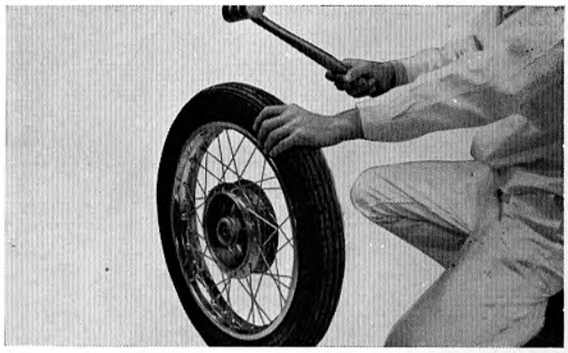
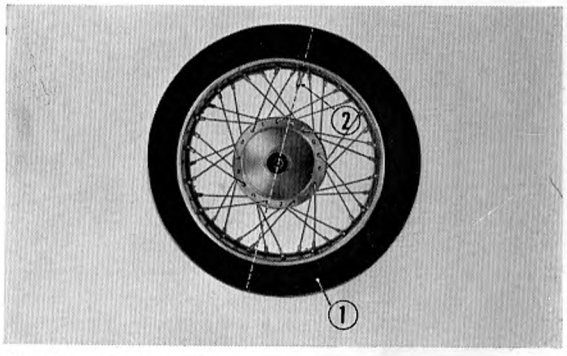


Fig. 4-44. Tapping around the tire



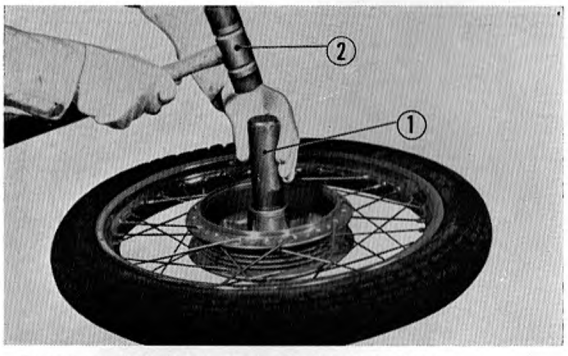
① Tire ② Valve stem
Fig. 4-45. Position of the valve stem

2. Pack the inside of the front wheel hub with grease, insert the spacing collar and then drive in the 6302 Z ball bearing which had been thoroughly greased. **(Fig. 4-46)**

(Note)

The 6302 Z ball bearing incorporates a seal on the outside, therefore, make sure that the bearing is not inverted.

3. Hook the spring on the front brake shoe and then install the anchor pin and brake cam. Assemble the unit to the front brake panel.
4. Assemble the panel together with the distance collar to the front wheel.
5. Connect the speedometer cable to the gear box.
6. Connect the front brake cable to the brake arm and adjust the free travel to 20～30 mm (0.8～1.2 in) **(Fig. 4-47)**



① Bearing installation tool ② Plastic hammer
Fig. 4-46. Installing the ball bearing

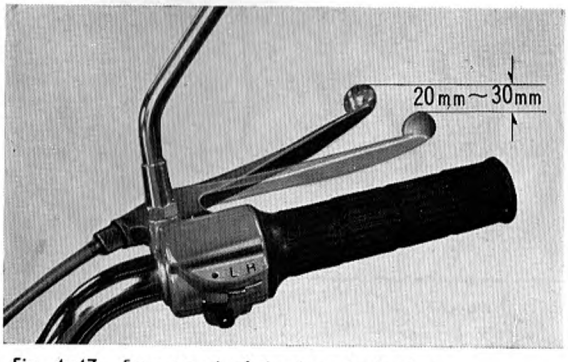
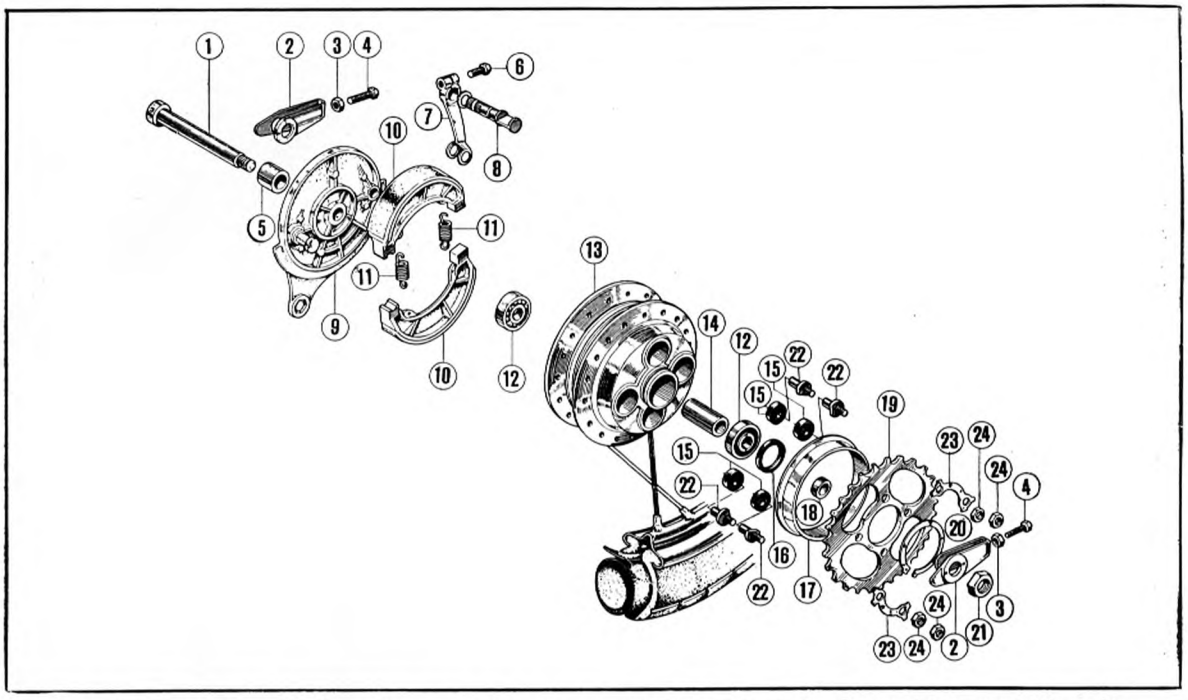


Fig. 4-47. Free travel of the front brake lever

4.12 REAR WHEEL

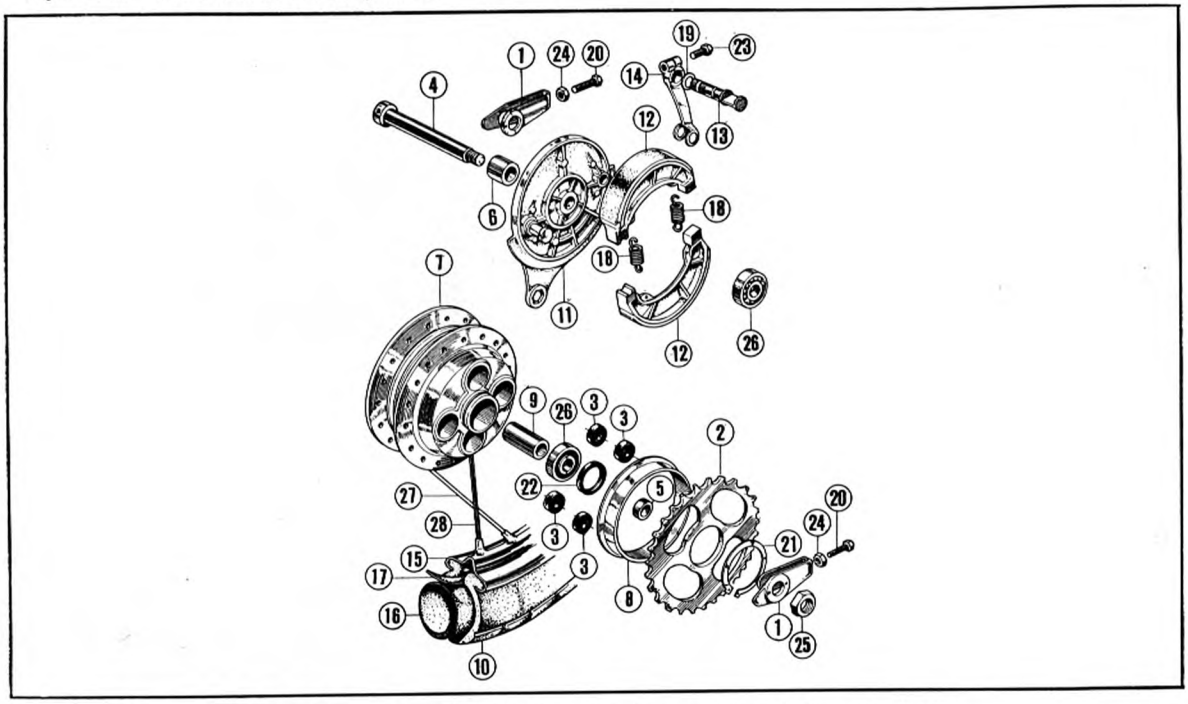
A. Description

The rear wheel consists of the 6302 Z ball bearings, aluminum cast rear wheel hub with brake drum, and the brake panel. It contains a single cam mounted in the brake panel. A single cam is mounted on the brake panel, and the final driven sprocket on the left side of the wheel hub. **(Fig. 4-48)**



① Rear wheel axle ② Drive chain adjuster ③ 6 mm hex nut ④ Chain adjust bolt ⑤ Rear brake panel side collar
⑥ 6×20 hex bolt ⑦ Rear br ake arm ⑧ Rear brake cam ⑨ Rear brake panel ⑩ Brake shoe ⑪ Brake shoe spring
⑫ 6302Z ball bearing ⑬ Rearwheel hub ⑭ Rear axle distance collar ⑮ Rear wheel damper bushing ⑯ 28427 Oil seal
⑰ Rear wheel dust seal ⑱ Rear wheel side collar ⑲ Final driven sprocket ⑳ 58 mm circlip ㉑ Axle nut
㉒ Driven sprocket fixing bolt ㉓ 8 mm tongued washer ㉔ 8 mm thin washer

Fig. 4–48A. Rear wheel CD175 Early model

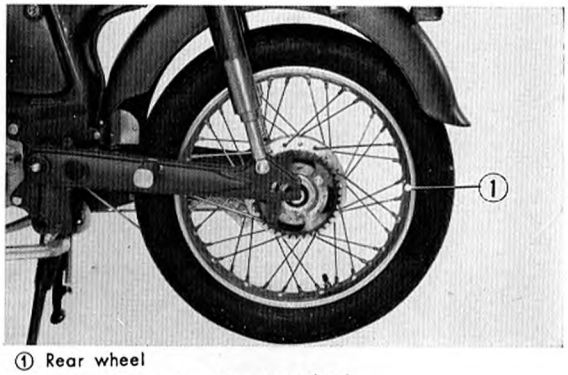


① Drive chain adjuster ② Final driven sprocket ③ Rear wheel damper bush ④ Rear wheel axle
⑤ Rear wheel side collar ⑥ Rear brake panel collar ⑦ Rear wheel hub ⑧ Rear wheel dust-seal
⑨ Rear axle distance collar ⑩ Rear wheel tire ⑪ Rear brake panel ⑫ Rear brake shoe
⑬ Rear brake cam ⑭ Rear brake arm ⑮ Wheel rim ⑯ Wheel tube ⑰ Tire flap ⑱ Brake shoe spring
⑲ Brake cam dust-seal ⑳ Chain adjust bolt ㉑ 58 mm circlip ㉒ 28427 oil-seal ㉓ 6×20 hex. bolt
㉔ 6 mm hex. nut ㉕ 14 mm hex. nut ㉖ 6302Z ball bearing ㉗ B#9×155 spoke ㉘ B#9×154.5 spoke

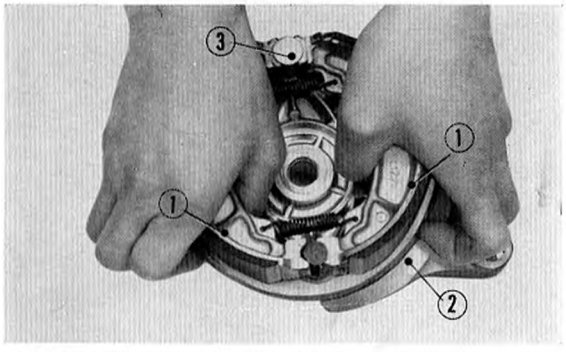
Fig. 4–48B. Rear wheel (all models)

B. Disassembly

1. Remove the chain case.
2. Remove the drive chain joint clip and disconnect the chain.
3. Disconnect the rear brake rod from the rear brake arm.
4. Loosen the rear brake torque bolt, and remove the rear brake torque link from the panel.
5. Loosen the rear wheel axle nut and draw out the rear wheel axle.
6. Tilt and remove the rear wheel. **(Fig. 4-49)**
7. Remove the 58 mm circlip using a plier ; the final driven sprocket can be removed from the rear wheel.
   The sprocket on the CD175 earlier model is fixed with 4 nuts and locked with tongued washers in addition to the circlip.
8. Remove the oil seal internal retainer, two 6302 Z ball bearings, and the rear axle spacing collars.
9. The rear brake shoe ① can be removed from the rear brake panel ② by spreading the shoe apart by hand. **(Fig. 4-50)**
10. Use the tire iron to remove the tire and tube.



① Rear wheel
Fig. 4-49. Removing the rear wheel



① Rear brake shoe ② Rear brake panel
③ Rear brake cam
Fig. 4-50. Removing the brake shoe

C. Inspection

1. Rim runout. **(Fig. 4-51)**

Item	Standard Value	Serviceable Limit
Side runout	0.5 mm Max (0.02 in)	Replace or repair if over 3.0 mm (0.118 in)
Vertical runout	0.5 mm Max (0.02 in)	Replace or repair if over 3.0 mm (0.118 in)

2. Axle bend and wear. **(Fig. 4-52)**

Item	Standard Value	Serviceable Limit
Outside diameter	14.957~14.984 mm (0.5886~0.5899 in)	Replace if under 16.85 mm (0.663 in)
Bend	0.01 mm Max (0.0004 in)	Replace if over 0.2 mm (0.008 in)

3. Final driven sprocket root diameter.

Item		Standard Value	Serviceable Limit
Root diameter	CD175	141.61~141.73 mm (5.5752~5.5799 in)	Replace if under 141.4 mm (5.571 in)
	CD125 CD125A	149.69~149.81 mm (5.893~5.898in)	Replace if under 149.48 mm (5.88 in)
	SS 125A CL 125A	161.93~162.05 mm (6.375~6.380 in)	Replace if under 161.72 mm (6.367 in)

4. 6302 Z ball bearing axial and radial clearance.

Item	Standard Value	Serviceable Limit
Axial clearance	0.05 mm (0.002 in)	Replace if over 0.1 mm (0.004 in)
Radial clearance	0.002~0.007 mm (0.0008~0.0014 in)	Replace if over 0.05 mm (0.002 in)

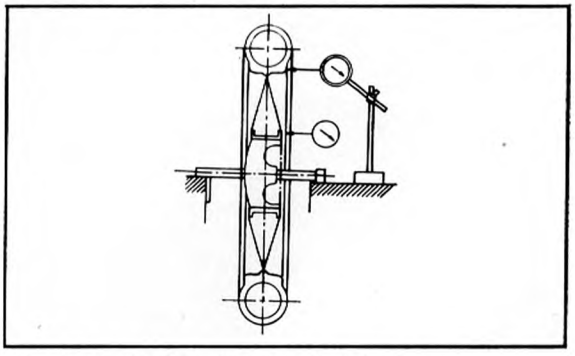
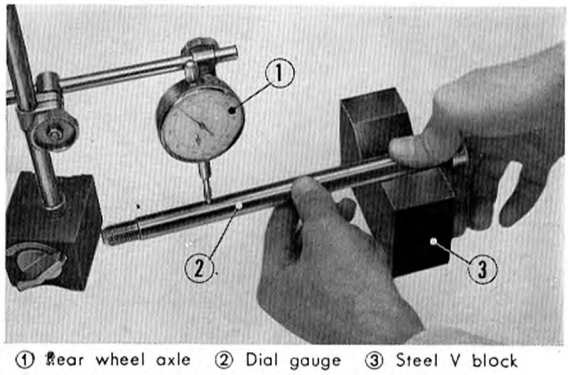
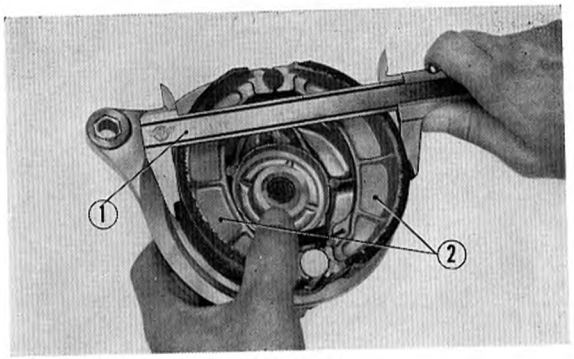


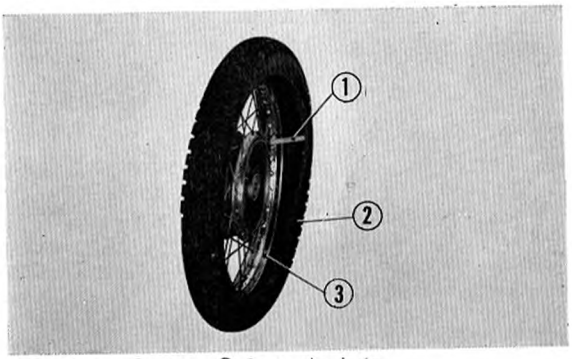
Fig. 4-51. Checking the rear wheel rim for runout



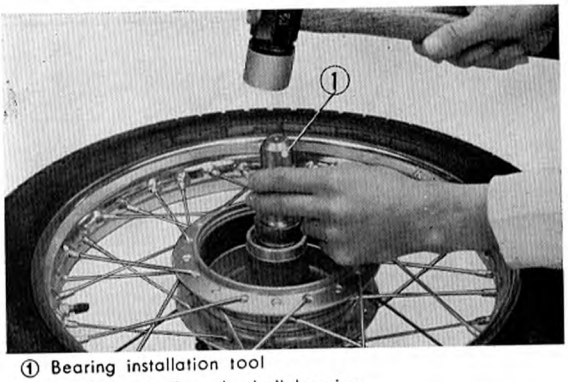
① Rear wheel axle ② Dial gauge ③ Steel V block
Fig. 4-52. Checking the rear axle for bend



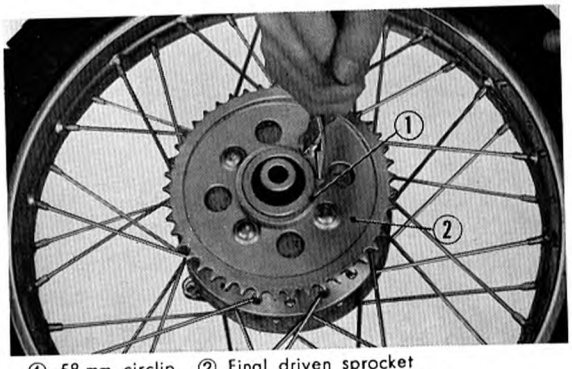
① Vernier caliper ② Brake shoes
Fig. 4–53. Measuring the rear brake shoes diameter



① Wood ② Tire ③ Rear wheel rim
Fig. 4–54. Inspecting the casing for any damage



① Bearing installation tool
Fig. 4–55. Installing the ball bearing



① 58 mm circlip ② Final driven sprocket
Fig. 4–56. Installing the final driven sprocket

6. Rear brake cam thickness.

Item	Standard Value	Serviceable Limit
Thickness	6 mm (0.236 in)	

7. Rear brake shoe diameter and lining thickness. **(Fig. 4–53)**

Item	Standard Value	Serviceable Limit
Diameter	129.3～129.5 mm (5.0905～5.0984 in)	
Lining thickness	4.5～4.8 mm (0.177～0.189 in)	

8. Inspect and tighten all loose spokes.
9. Inspect tube for air leakage by inflating and placing it in water.
10. Inspect the casing for any damage. **(Fig. 4–54)**

D. Reassembly

1. The tube can be easily mounted by inflating with small amount of air to make the tube firm.

(Note)

(a) After the tire is mounted, inflate with approximately 1/3 the designated pressure and lightly tap around the tire with a wooden hammer to eliminate any pinching of the tube.

(b) The valve stem should be pointed toward the axle.

2. Grease the 6302 Z ball bearing and pack the rear wheel hub with grease. Insert the spacer and drive the 6302 Z bearing into place. **(Fig. 4–55)**

(Note)

The 6302 Z ball bearing incorporates a seal on outside therefore, make sure that the bearing is not inverted.

3. Mount the final driven sprocket ① on the drive flange with the 58 mm circlip. **(Fig. 4–56)**

4. Assemble the rear brake shoe to the brake panel and install the spring to hold the shoe in place.
5. Assemble the panel on the rear wheel and mount the wheel assembly on the frame. Install the drive chain and make the proper adjustment before final torquing of the rear wheel axle. **(Fig. 4–57)**

(Note)

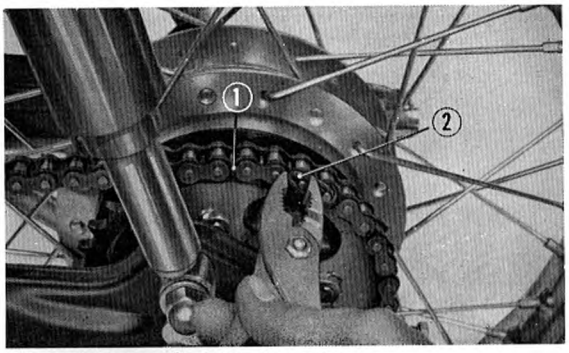
Adjust the chain so that there is 10 to 20 mm (0.40 to 0.80 in) of slack and make sure that the chain adjuster on both sides is in the same relative position.

6. Install the rear brake stopper arm to the rear brake panel.
7. Install the rear brake rod to the brake arm. Set the rear brake panel on its side and adjust rear brake play.

(Note)

The free travel of the rear brake pedal should be from 20 to 30 mm (0.8 to 1.2 in). **(Fig. 4–58)**

8. Install chain case.



① Drive chain ② Drive chain clip
Fig. 4–57. Installing the drive chain

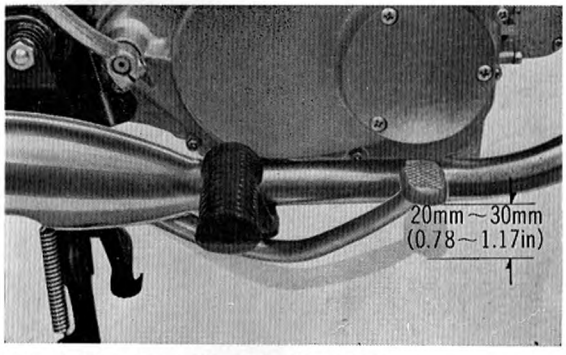


Fig. 4–58. Rear brake pedal free travel

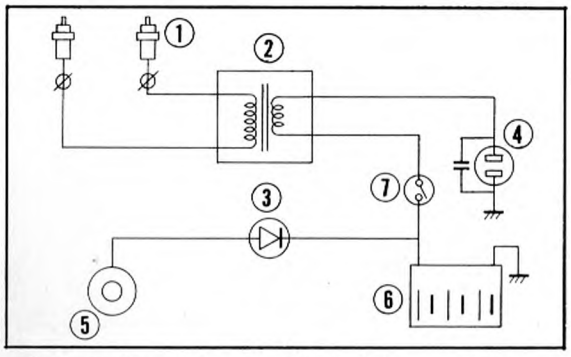
MEMO

5. ELECTRIC SYSTEM

These models use essentially the same basic electrical system with a varying degree of minor differences. The electrical equipment and their installation depend upon the wiring circuitry.

The ignition system is comprised of a special A.C. generator with the use of an ignition coil and contact breaker to provide easy starting. The charging and power supply to the electrical system is provided by the combination of A.C. generator and selenium rectifier to take care of the discharge load such as the horn, lights and the indicator lamps. The function of the electrical system can be classified as follows: **(Fig. 5-1)**

1. Ignition system (ignition coil, condenser, contact breaker and spark plug)
2. Generating system (A.C. generator)
3. Rectifying system (selenium rectifier)
4. Battery
5. Various loads (lights and horn)



① Spark plug ② Ignition coil ③ Selenium rectifier
④ Contact breaker ⑤ A.C. generator ⑥ Battery
⑦ Switch
Fig. 5-1. Ignition system

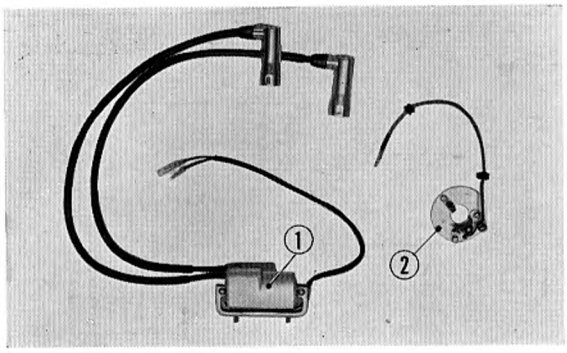
1. IGNITION CIRCUIT

The ignition systems are divided into following two major types.

a. Battery ignition system
b. Magneto ignition system

From the standpoint of producing ignition by means of electrical spark, both systems are identical. In the battery ignition, the source of the spark is the battery, while, in the magneto ignition, the magneto generates the spark.

The basic components which constitute the battery system is shown **Fig. 5-1**. The contact breaker is a device which disrupts the current flow from the ignition coil by means of the breaker point cam. This cam is provided with a centrifugal type automatic spark advancer to control the contact breaker in respect to the engine speed. Breaker point cam is mounted on the end of the crankshaft and turns at the same speed as the crankshaft. This will provide an ignition spark at every revolution of the crankshaft. However,on a 4-cycle engine, ignition is only required at every other revolution. This condition is satisfactory since the unwanted ignition occurs at the end of the exhaust stroke and does not have any effect on the operation of the engine. It is possible to design a contact breaker that will operate at one-half of the crankshait speed. This principle is employed in the CD175 and CD175A models.



① Ignition coil ② Contact breaker
Fig. 5–2. Ignition parts

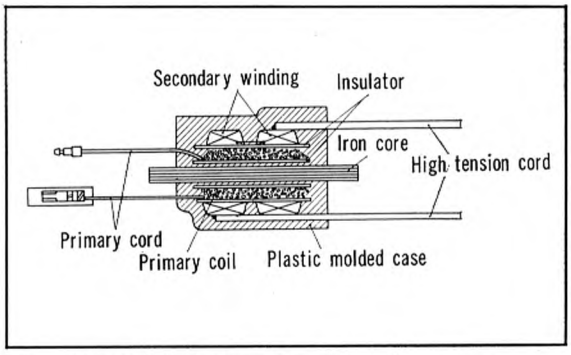


Fig. 5–3. Sectional view of ignition coil

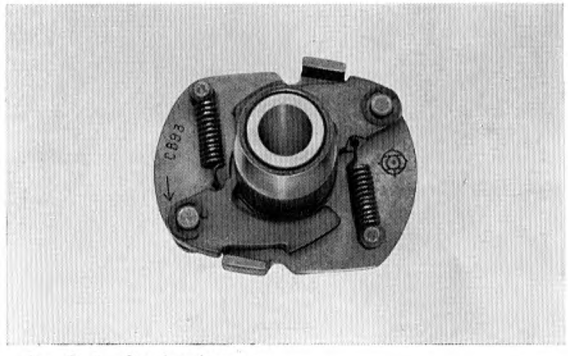
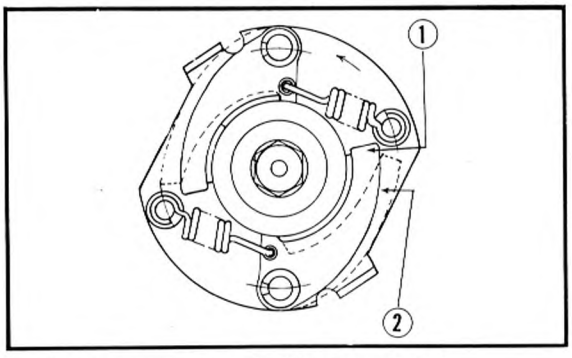


Fig. 5–4. Spark advancer



① 5° advanced angle ② 40° advanced angle
Fig. 5–5. Graph of spark advancer

A. Ignition Coil (Fig. 5–2)

The ignition coil is made up of a primary coil which comprises of approximately 200 to 300 turns of 0.6 mm (0.024 in) enameled copper wire wound over an iron core, and a secondary coil of 10,000 to 20,000 turns of 0.075 mm (0.003 in) enameled copper wire. Coil is coated with dielectric material and molded in a synthetic compound with two exposed terminals. **(Fig. 5–3)**

B. Spark Advancer

Ignition timing is automatically advanced with the increase in engine RPM. The device which performs this function is the automatic spark advancer. It utilizes the centrifugal force of a rotating mass to actuate a cam which controls the opening of the breaker points. **(Fig. 5–4)**

The spark advancer, mounted on the left end of the camshaft for the CD175 model and mounted on the end of the A.C. dynamo rotor for the CD125A, SS125A and CL125A is held in a fixed position, at 5° advance, by a spring. As the engine speed increases, the revolving weights on the advancer moves outward by centrifugal force, overriding the force of the spring to move the cam in the direction to cause an early ignition.

The spark advancer starts to become active at the engine speed of 900 RPM (CD125A : 1200 RPM, SS125A/CL125A : 1800 RPM) and advances 40° at 3,900 RPM (CD125A : 4200 RPM, SS125A/CL125A : 3200 RPM). **(Fig. 5–5)**

C. Contact Breaker

Contact breaker is a device which performs a very important function of interrupting the primary circuit of the ignition coil to enable the build-up of the high secondary voltage. It is composed of the breaker arm, stationary and movable points, primary terminal, breaker arm spring and oil felt; all of which are assembled on the base plate and mounted together with the spark advancer. The breaker arm is a formed sheet metal piece with a bakelite cam follower attached to one end. It must operate very lightly and, further, in order to minimize the inertia, the arm must be light and strong. **(Fig. 5-6, 5-7)**

The movable point requires a strong spring tension to prevent chattering during the collapse of the primary circuit, however, on the other hand, the tension must not be excessively strong so as to cause wear of the friction areas, which would result in change to the ignition timing.

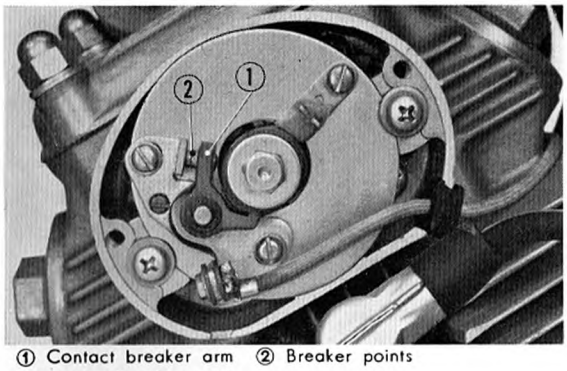
The proper breaker point tension is 650~850 g (1.4-1.9 lbs). **(Fig. 5-8)** To prevent wear to the friction areas, a small amount of grease is applied to the felt lubricating wick and also to the pivot shaft.

Necessary requirements of breaker points.

① Must be wear resistance
② Good electrical conductor
③ High melting temperature
④ High resistance to oxidation
⑤ Not effected by oil or water
⑥ Possess suitable hardness

Inspection

1. Make sure that the points are free of oil.
   a. Points become black and result in excessive wear, if dirty.
   b. If left uncleaned for a long time, a hardened oil insulation film will result and causes faulty ignition.
2. Breaker arm with excessively worn pivot hole should be replaced.
3. Make sure that the insulation at the contact breaker terminal is free of oil, water and dirt.
4. Pitted or dirty points should be cleaned with a point file or sandpaper. Points with excessively pitted surfaces should be removed and both surfaces dressed so that the points are making parallel contact.



① Contact breaker arm ② Breaker points
Fig. 5-6. Breaker points

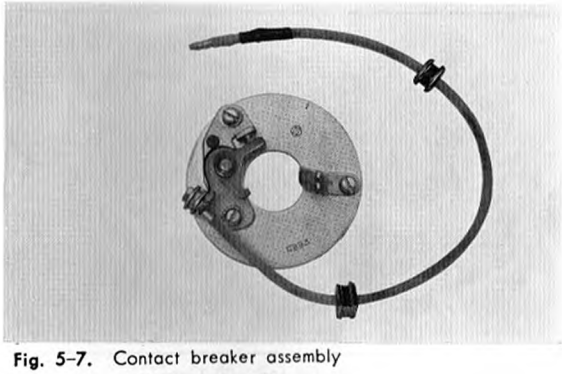


Fig. 5-7. Contact breaker assembly

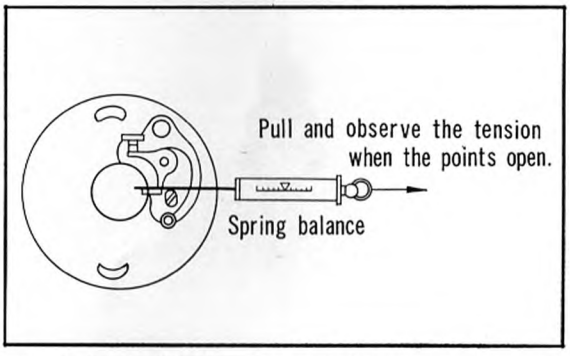


Fig. 5-8. Checking breaker arm tension

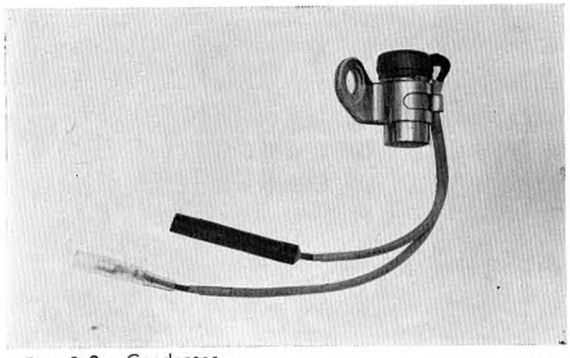
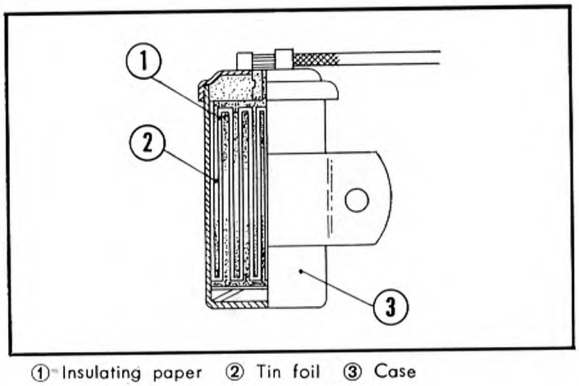


Fig. 5-9. Condenser



① Insulating paper ② Tin foil ③ Case

Fig. 5-10. Construction of condenser

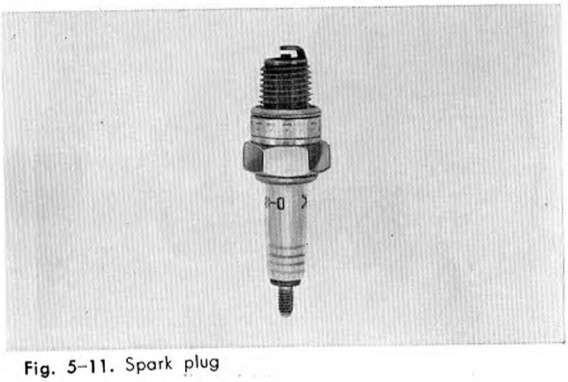


Fig. 5-11. Spark plug

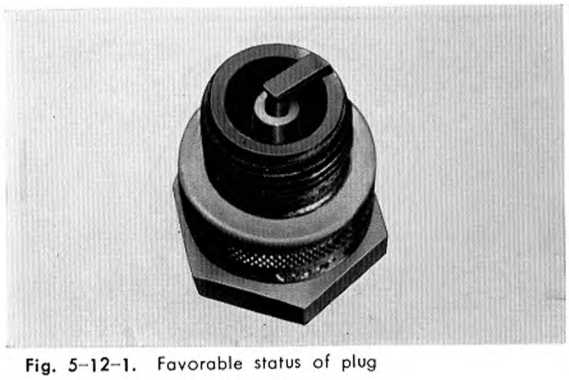


Fig. 5-12-1. Favorable status of plug

D. Condenser

The purpose of the condenser is to prevent unwanted sparking across the points, however, if the condenser capacity is too large, the ignition spark will deteriorate, normal value is 0.3 μf.

At the instance of point opening, the condenser will have several thousand volts applied momentarily, therefore, it must have sufficient capacity to withstand this surge. **(Fig. 5-9, 10)**

After performing a leak test on the megger, a simple capacity test of the condenser can be made by removing the terminals with the megger still on and use a wire to short across the terminals. If there is a good strong spark, the con denser can be assumed to be in good condition. Actually, the capacity of the condenser will not change. A use of a service tester will provide on accurate measurement of the capacity and resistance values.

E. Spark Plug

Spark plug performs one of the most important functions in the engine ignition system. The high voltage produced by the ignition coil is received by the spark plug and produces the high tension spark as it jump across from the center electrode of the spark plug to the side electrode.

The spark ignites the compressed fuel mixture in the combustion chamber and causes an explosion which operates the engine. Even under various adverse conditions, durability and reliability is required.

CD175A : NGKD-8HS SS125A : NGKD-10HS
CD125A : NGKD-6HS CL125A : NGKD-10HS
(Fig. 5-11)

1. Spark Plug Condition
   The operation of the engine can be determined by the condition of the plug. The firing area of the insulator colored white, gray or light gray indicates good condition and is performing satisfactory. **(Fig. 5-12)**
2. Heat Range
   The firing area of the spark plug insulator is exposed to carbon and oil while the engine is operating. and to prevent its build-up, plugs are desingeb to burn off any deposits by the heat of combtusion.

In order to function as above, the surface of the insulator firing area must be maintained at approximately 500~870°C (932~1,600°F) range. This temperature is referred to as the self-cleaning temperature, and will vary to a considerable degree with the type engine and design, riding condition and type fuel used.

In order for the plug to function properly under the different conditions, it is necessary for it to dissipate the heat caused by the combustion.

The rate of heat dissipation of the plug in determined by the heat range of the plug. A plug which readily dissipates the heat and which is difficult to overheat is referred to as a "Cold Type". A plug which retains the heat and which will burn readily is referred to as a "Hot Type". On engine operating at high temperature, a plug which is difficult to overheat, in other words, the cold type plug is used and for engine operating at low temperature a hot type plug is used. **(Fig. 5-13)**

3. Spark Plug Reach

The reach of the spark plug refers to length of the threaded section. Different model motorcycles have cylinder head designed with different depth of spark plug hole, therefore, the spark plug with the proper reach should be used. **(Fig. 5-14)**

Reach : D=12.7 mm

The following unsatisfactory conditions will occur if plug of improper reach is used.

(1) Reach too long

a. Carbon will be deposited on the exposed thread and cause damages to the threads in the spark plug hole during plug removal.

b. The plug tip will become overheated, causing pre-ignition.

(2) Reach too short

a. Carbon will be deposited on the threads at the bottom of the plug hole and when the spark plug of the proper reach is installed, the threads will be damaged or stripped.

b. Due to the cavity left by the short reach, exhaust gas will accumulate causing a decrease in power output, overheating and engine malfunction.

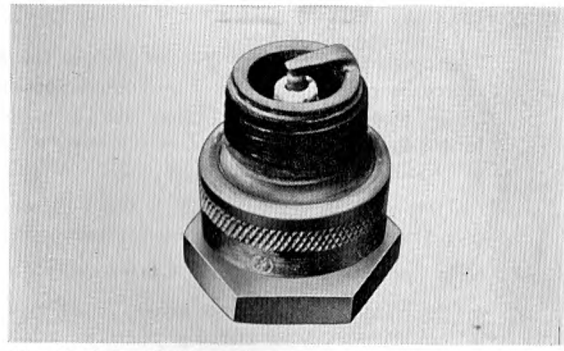
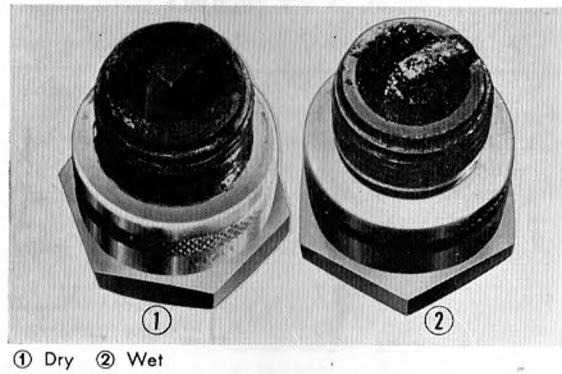
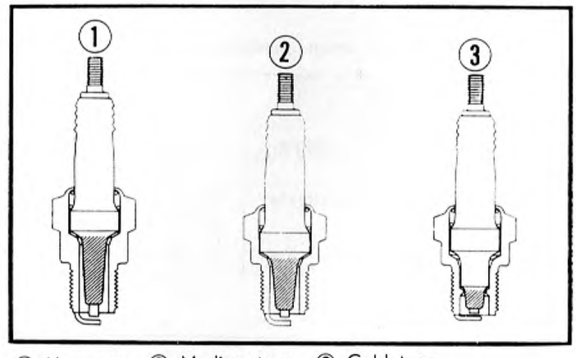


Fig. 5-12-2. Overheated plug



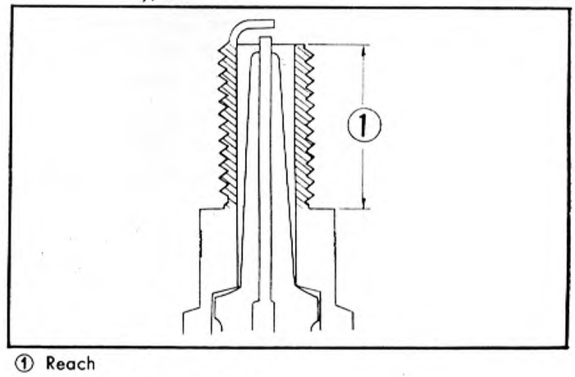
① Dry ② Wet

Fig. 5-12-3. Plugs indicating smoking condition



① Hot type ② Medium type ③ Cold type

Fig. 5-13. Sectional view of the spark plug heat ronge types



① Reach

Fig. 5-14. Spark plug reach

4-STROKE.NET

4. Spark Plug Gap

The spark plug firing, regardless of whether the primary power supply is from an A.C. generator or a D.C. source, is produced by the high voltage secondary coil. The voltage generated will vary with the engine speed, however, with the proper spark gap, there is always sufficient voltage to produce a spark required for the ignition of the compressed fuel mixture. If the spark gap is too wide, a very high voltage is necessary to produce the necessary spark and, in which case, a misfire will result at low speed.

On the other hand, if the gap is too narrow, a spark will be produced at a very low voltage and being of a low energy, an incomplete explosion will take place, resulting in engine malfunction.

5. Main Spark Plug Trouble and Corrective Action.

a. Poor starting, occasional misfire, knocking during acceleration.
b. Malfunctions when climbing, backfires, pre-ignition.

5. MAIN SPARK PLUG TROUBLE AND CORRECTIVE ACTION

A. Poor starting, occasional misfire, knocking during acceleration.

Symptom	Probable cause	Corrective action
1. Dirty plug electrodes (sooty) 2. Plug wet with fuel 3. Flushed over	Misfire caused by the insulation of the electrodes due to carbon deposits or fouling with oil. 1. Too rich a fuel mixture. 2. Excessive intake of fuel during starting. 3. Heavy carbon deposit on the electrode resulting in bridging or narrowed gap.	1. Adjust the spark gap, adjust carburetor. 2. Dry the plugs, change the procedure on the use of choke. 3. Clean and properly adjust the gap. Standard gap : 0.6–0.7 mm (0.024–0.028 in)

B. Malfunctions when climbing, backfires, pre-ignition.

Symptom	Probable cause	Corrective action
1. Electrodes not noticeable dirty. 2. Electrodes excessively eroded. 3. Small deposits on the insulator. 4. Indication of burning.	1. Spark plug Insufficiently torqued causing exhaust gas leak. 2. Too lean a fuel mixture. 3. Ignition timing too early 4. Improper plug, heat range too low.	1. Replace plug gasket or retorque the plug. 2. Adjust the carburetor. 3. Adjust ignition timing. 4. Replace with plug of higher heat range. (higher numbered plug)

F. Noise Suppressor

The oscillating current which contains the high frequency radio wave produced by the high tension ignition circuit is radiated from the high tension circuit and the vehicle chassis to cause interference to the reception of the radio and television sets. To prevent this undesirable condition, the spark plug is fitted with a suppressor.

The suppressor consists of a resistor incorporated with in the plug cap and housed in the shield cover. The resistor functions as a diminishing resistor, the shield cover increases the high frequency suppressing characteristics as a combined part of the suppressor.

(Caution)

1. The suppressor should be handled in the same manner as the plug cap, however, provide adequate care to the junction of the high tension cord and make sure that the cord is fully screwed in.
2. If the resistance value should accidentally change or if the value should become infinate, it should not effect the performance; (discoloration of the outer insulated coating) it is recommended, however, that it be changed with a new item.

2. ELECTRICAL POWER SUPPLY

A. A.C. Generator (Fig. 5–15)

A generator produces electricity because an iron core cuts across a magnetic field. This basic principle holds true both in the flywheel magneto, D.C. generator or an A.C. generator.

In the A.C. generator, the output voltage changes direction henceforth, the name A.C. (alternating current generator.

The advantage of an A.C. generator is that the malfunction, as compared to the other types, is less frequent due to its simpler construction and fewer parts which are subject to wear. Another major advantage is that the kick starter can be employed as an auxiliary starting method even with the battery completely discharged. This is because the A.C. generator induces a large voltage which, when fed through the rectifier to the ignition coil, will produce a spark of sufficient strength to produce ignition.

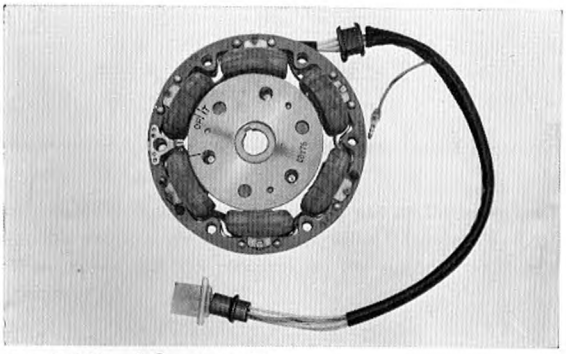
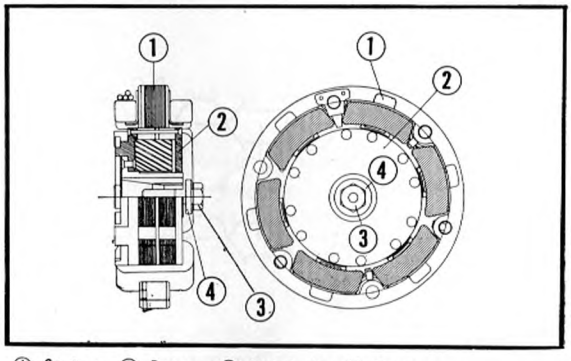


Fig. 5–15A. A.C. generator

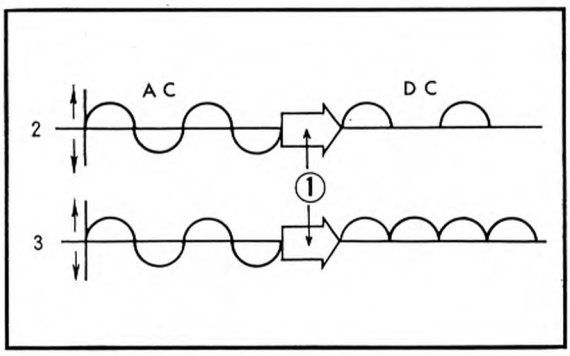


① Stator ② Rotor ③ Set bolt ④ Washer

Fig. 5–15B. A.C. generator construction

Items	CD175/A	CD125/A
RPM	300–11,000 RPM	300–10,500 RPM
Normal voltage	6V	6V
Electrical load	After full wave rectification. Day : 6V–12AH battery+ignition coil (Single lobe cam with spark every revolution, contact breaker remains closed 180° of each revolution) Night : In addition to the day load, the lamp loads are added (H.L. 30W. T.L. 5W, M.L. 3W, B.L. 1.5W)	After half wave rectification. Day : 6V–6AH+ignition coil (D.C. ignition, spark every revolution, contact breaker remains closed 180° of each revolution) Night : In addition to the day load, the lamp loads are added (H.L. 25W, T.L. 5W, M.L. 3W)
Charging • Initial charging speed • Charging voltage at 5000 RPM	Day : 2500 RPM max Night : 2800 RPM max Day : 1.5±0.5A Night : 1.5±0.5A	Day : 1200 RPM max Night : 2000 RPM max Day : $2.0\ ^{+0.5A}_{-0.3A}$ Night : $2.0\ ^{+0.5A}_{-0.3A}$

Items	SS125A/CL125A
RPM	300–11,000 RPM
Normal voltage	6V
Electrical load	After full wave rectification Day: 6V–12AH battery+ ignition coil. (D.C. ignition, spark every revolution, contact breaker remains closed 180° of each revolution) Night: In addition to the day load, the lamp load are added. (H.L. 35W, T.L. 5W, M.L. 3W, H.L. 1.5W)
Charging • Initial charging speed	Day: 2500 RPM max Night: 3300 RPM max
• Charging voltage at 5000 RPM	Day: 0.7±0.3A Night: 1.5±0.3A



① Rectifier

Fig. 5–16. Selenium rectifier construction diagram

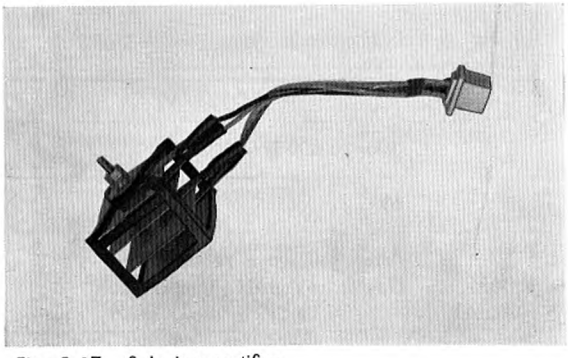


Fig. 5–17. Selenium rectifier

3. SELENIUM RECTIFIER

A rectifier is an equipment which converts the A.C. (alternating) current to a D.C. (direct) current and is necessary for use with an A.C. generator or an A.C. generating coil. Battery requires D.C. voltage for charging and if the electrical voltage produced by the generator is an A.C., this must be converted to D.C. so that the battery can receive the charge.

Rectification is a process of causing the cyclic reversing current to flow in only one direction. As shown in the figure, it permits the current to flow in one direction but blocks the current from flowing in the opposite direction, thus, is known as a half wave rectification ②. There is another type which changes the reverse flow of current so that if also flows in the same direction; this is known as full wave rectification ③. **(Fig. 5–16)**

Rectifiers are of many types in construction, material and shape, however, principally the theory of operation is the same, i.e., the current is readily permitted to flow in one direction but restricted from flowing in the opposite direction.

The selenium rectifier is made with the plate of either aluminum or nickle plated steel sheet coated or vacuum plated with a highly purified selenium and a rare element. This plate is heat treated under a controlled pressure followed by spray coating an area which will be used as a terminal. In which case, a special electrolytic action is set up at the layer between the selenium wafer and the sprayed alloy terminal. As shown in the figure, the current will readily flow in the normal direction and only a negligible amount flows in the opposite direction.

When this unit is placed in the primary A.C. circuit, the current will flow in only the specified direction from the output side. **(Fig. 5–17)**

A. Selenium Rectifier Installation and Handling

1. Do not bend, cut or scratch the selenium wafers.
2. The rectifier locking nut should not be loosened or the wafers rotated.

   Any movement will cause the electrode alloy to peel, affecting the rectification function, further, it will destroy the moisture proofing and, thereby, shortens the life of selenium rectifier.
3. Take adequate precaution not to permit rain, salt water, water or battery electrolyte to get on the selenium rectifier, as it will cause the amount of current flowing in the reverse direction to increase. Further, if the selenium wafer if exposed to moisture for any length of time, oxide will be produce on the surface, resulting in a shorted condition, and the following trouble will occur.
   a. Battery will be discharge.
   b. Malfunction of the charging system.
4. Do not operate engine without the battery or without electrical load connected to the circuit.

(Example)

a. Loose or disconnected lead at the battery terminal.
b. Loose or disconnected terminals on the lead between the battery and ⊕ side of the selenium rectifier.
c. Running without a battery.

If the engine should be started under the above condition or if such condition should develop while the engine is being operated, a high voltage will be produced due to the absence of any load on the coil, and this high voltage will cause a large amount of current to flow through the rectifier in the reverse direction, resulting in the eventual damage to the selenium rectifier.

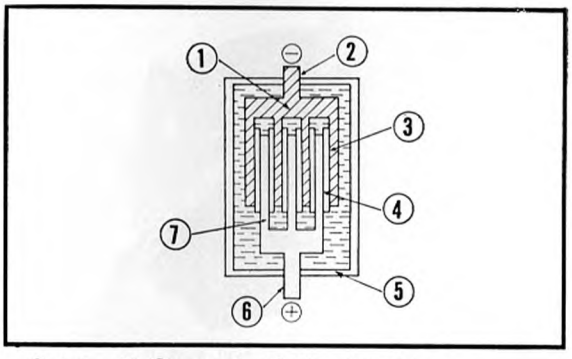
Therefore :

a. Always maintain all electrical connections in the circuit in a good condition.
b. Under no circumstances should the engine be started without the battery on with the battery leads disconnected.

4. BATTERY

A. Construction

Construction of the battery is shown in **Fig. 5–18.** The positive ⊕ plates are made of lead peroxide, the negative ⊖ plates are made of porous lead sponge. The sulfuric acid is used as the electrolyte. The chemical action caused by two plates being placed in the electrolyte medium generates electrical current. In addition, a separator plate and a sheet of glass fiber mat are placed between the positive and negative plates to prevent their shorting and also to protect the plates from damage due to vibration.



① Pole ② ⊖ terminal ③ Negative plate
④ Separator and glass mat ⑤ Container ⑥ ⊕ terminal
⑦ Positive plate
Fig. 5–18. Battery construction

B. RATING

Item	CD175, SS125A, CL125A	CD125A
Type	B54–6	B36–6
Voltage	6V	6V
Capacity	12AH	6AH
Specific gravity of electrolyte	1.260–1.280 S.G. at 20°C (68°F)	Same as left

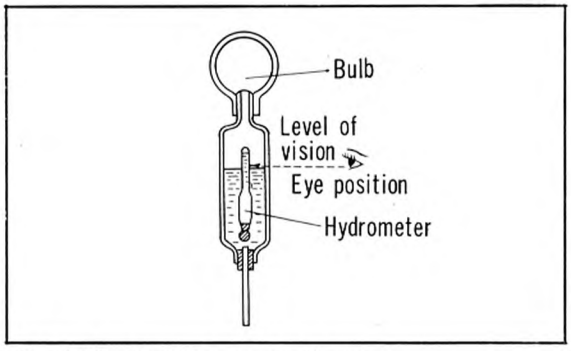
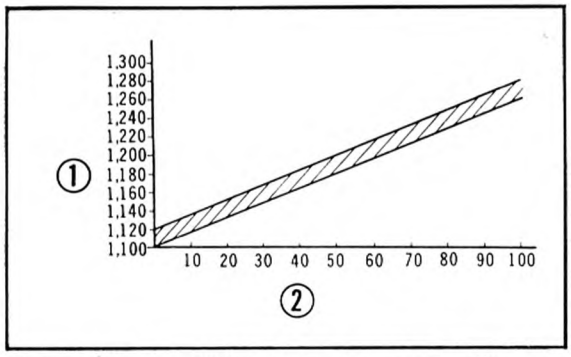
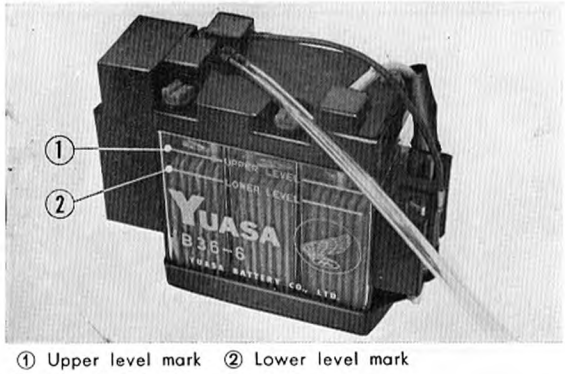


Fig. 5-19. Measuring the specific gravity



① Specific gravity (20°C) ② Residual capacity (%)
Fig. 5-20. Specific gravity and residual capacity chart



① Upper level mark ② Lower level mark
Fig. 5-21.

C. Battery Servicing

The electrolyte used in the battery must be comprised of pure sulfuric acid diluted to the designated specific gravity. The specific gravity will vary with the temperature, therefore, the specific gravity index is based on the eletrolyte temperature of 20°C (68°F). The temperature correction formula should be used to derive at the proper specific gravity for the measured temperature of the electrolyte.

$S20 = St + 0.0007\ (t-20)$

Where: S20 = specific gravity of the electrolyte corrected to 20°C (68°F)
St = specific gravity of the electrolyte measured temperature, t°C
t = temperature of the measured electrolyte

The specific gravity is measured with a hydrometer, the type shown in **Fig. 5-19**. When making a reading of the measured value, the electrolyte level in the hydrometer should be held at the eye level and the scale read at the fluid level. Temperature of the electrolyte can be measured by a rod thermometer. **(Fig. 5-19)**

(Note)

The relation between the battery capacity and the specific gravity (residual capacity) is shown in **(Fig. 5-20)**. When the specific gravity is 1.189 at 20°C (68°F) (less than 50% capacity) the residual capacity is small and if continued to be used in such a condition, it will eventually lead to trouble as well as shortening the battery life, therefore, the battery should, under such a condition, be recharged as soon as possible. **(Fig. 5-20)**

2. Inspecting the electrolyte level. As shown in **Fig. 5-21**, if the electrolyte level falls below the LOWER LEVEL, remove the filler cap with a screw driver or an appropriate tool and fill the battery to the UPPER LEVEL with distilled water or battery water. Do not fill beyond the UPPER LEVEL. **(Fig. 5-21)**
3. Whenever the vent pipe is removed during recharging, it must be reconnected when the battery is installed. Care should be exercized not to restrict the opening.

D. Battery Charging Procedure

1. Connection to Charger (Fig. 5–22)

Connect the positive (+) terminal of the battery (colored red) to the positive terminal of the charger, and the negative (—) battery terminal to the negative terminal of the charger. **(Fig. 5–22A)**

When more than one battery is to be charged at once, they should be connected in series, as shown in **(Fig. 5–22B).**

(Note)

When series charging more than one battery, the charger voltage must be the sum of the battery voltages. For example, to charge three six-volt batteries, the charger must have an output voltage in excess of 6+6+6 or 18 volts.

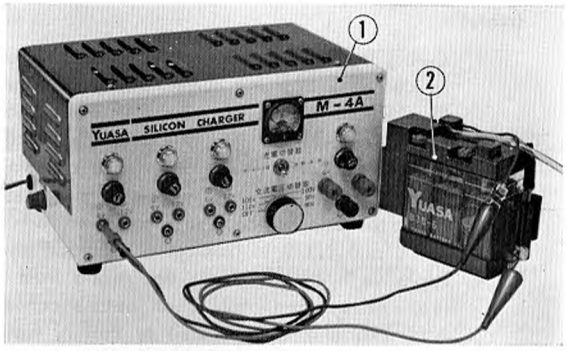


Fig. 5–22A. ① Charger ② Battery

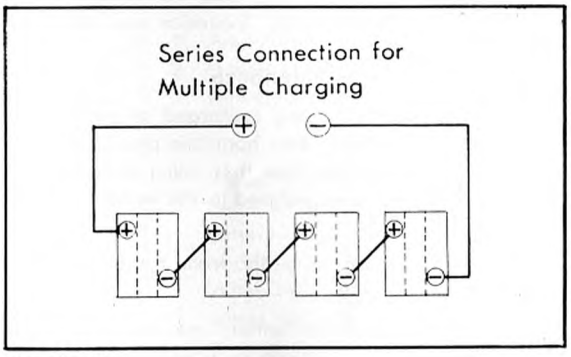


Fig. 5–22B.

2. Charging

Charge the battery at the current specified in following table.

Type	Voltage (V)	Capacity at 10-hr rate (AH)	Charging current (A)	Electrolyte		Specific gravity of electrolyte when fully charged at 20°C (68°F)
				Specific gravity at 20° (68°F)	Volume of electrolyte required for filling (liters)	
B54–6 (Used on CD175, SS125A & CL125A)	6	12	1.2	1.260	0.35	1.280
B36–6 (Used on CD125A)	6	6	0.6	1.260	0.26	1.280

The charging time for a new battery is determined by the length of time in storage since the date of manufacture. (Date of manufacture is printed on the back of the specification booklet, enclosed with motorcycle battery).

The table shows the approximate charging times for new battery.

Duration of storage	Less than 6 mos.	6 to 12 mos.	Over 12 mos.
Duration of charge	10 to 20 hrs.	20 to 30 hrs.	Over 30 hrs.

(Note)

1. During the charging operation, if the battery temperature exceeds 45°C (113°F), discontinue charging or decrease charging current to 1/2 of the specified value until the temperature recedes to a safe level. In which case, charging time must be increased.
2. Be sure to charge the battery at the specified current.
3. If the electrolyte level falls during charging, refill with distilled water to the upper level mark (to the level indicator in hard rubber-case batteries).
   Near the end of the charging period, adjust the specific gravity to between 1.270 and 1.290 (between 1.250 and 1.270 in tropical areas), and continue charging for two to three additional hours.
4. Explosive hydrogen gas is discharged from the cells, therefore, do not charge batteries near any open fire. Always turn charger off before connecting or disconnecting batteries.
5. After charging, add distilled or battery water to the cells to bring the electrolyte to the upper level mark (to the level indicator in hard rubber case batteries).
   Tighten cell caps firmly and wash off with clean water any acid spilled.
6. The battery is now ready for installation. When installing motorcycle battery, be sure not to pinch the battery vent tube. Explosion may result if the exhaust tube is blocked.

3. Preventative Maintenance

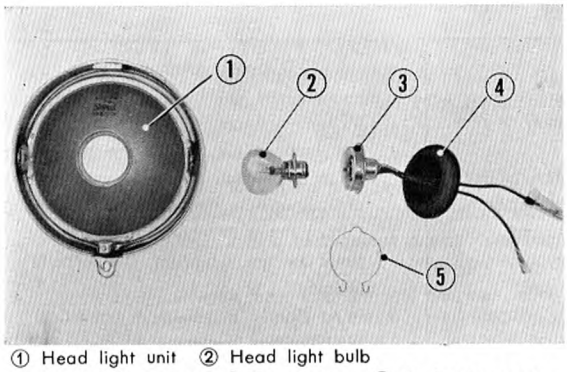
The battery is being recharged all the while the engine is running. Further, while running, the load such as the use of the winker, horn are placed on the battery (discharged), as the result, the battery is being discharged at the same time it is being recharged. In the long run, the discharge and the recharge is in balance. The system has been designed in this manner. Under certain condition when the balance is upset, then trouble develops.

To obtain maximum life from the battery, it is necessary to locate this trouble and take the appropriate action early.

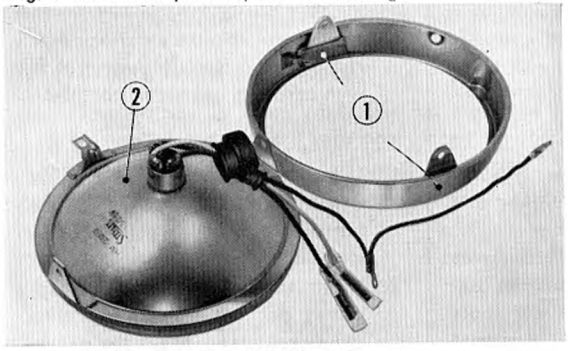
The trouble to the battery are mainly external such as cracked case, broken terminal, disconnected lead wire. The battery condition, trouble, corrective action are shown in the following table.

E. TROUBLE SHOOTING AND CORRECTIVE ACTION

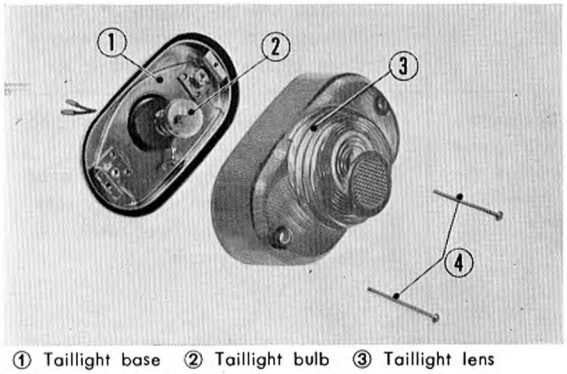
Trouble	Probable cause	Correct action
A. Sulfation The electrode plates are covered with white layer or in spots.	1. Charging rate is too small or else excessively large. 2. The specific gravity or the mixture of the electrolyte is improper. 3. Battery left in a discharged condition for a long period. (Left with the switch turned on). 4. Exposed to excessive vibration due to improper insulation. 5. Motorcycle stored during cold season with battery connected.	1. When motorcycle is in storage, the battery should be recharged once a month even though the motorcycle is not used. 2. Check the electrolyte periodically and always maintain the proper level. 3. In a lightly discharged condition, performing recharging and discharging several times by starting the engine may be sufficient.
B. Self discharge Battery discharges in addition to that caused by the connected load.	1. Dirty contact areas and case. 2. Contaminated electrolyte or electrolyte excessively concentrated.	1. Always maintain the exterior clean. 2. Handle the replenishing electrolyte with care and use clean container.
C. Large discharge rate Specific gravity gradually lowers and around 1.100, S.G the winker and horn no longer function.	1. The fuse and the wiring is satisfactory, loads such as winker and horn does not function. In this condition the motorcycle will operate but with prolong use, both ⊕ and ⊖ plates will react with the sulfuric acid and form lead sulfide deposits, (sulfation) making it impossible to recharge.	1. When the specific gravity falls below 1,200 (20°C : 68°F), the battery should be recharged immediately. 2. When the battery frequently becomes discharged while eperating at normal speed, check the generator for proper output. 3. If the battery discharges under normal charge output, it is an indication of overloading, remove some of the excess load.
D. High charging rate The electrolyte level drops rapidly but the charge is always maintained at 100% and the condition appears satisfactory. A condition which is overlooked. (Specific gravity over 1.260)	1. The deposit will heavily accumulate at the bottom and will cause internal shorting and damage the battery.	1. Check to assure proper charging rate. 2. When overcharge condition exist with the proper charging rate, place an appropriate resistor in the charging circuit.
E. Specific gravity drops Electrolyte evaporates	1. Shorted 2. Insufficient charging 3. Distilled water overfilled 4. Contaminated electrolyte	1. Perform specific gravity measurement. 2. If the addition of distilled water causes a drop in specific gravity, add sulfric acid and adjust to proper value.



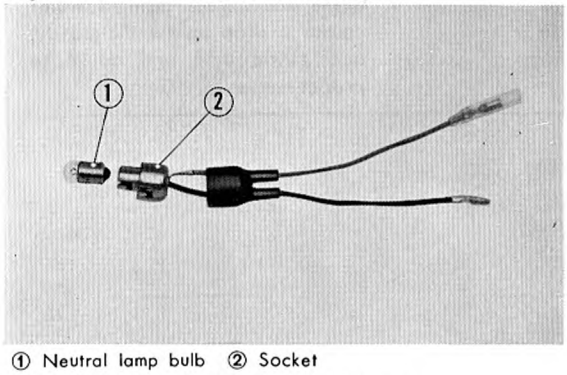
① Head light unit ② Head light bulb
③ Head light socket ④ Dust cover ⑤ Socket supporter
Fig. 5-23A. Component parts of head light



① Head light rim ② Head light unit
Fig. 5-23B. Component parts of head light (SS125A/CL125A)



① Taillight base ② Taillight bulb ③ Taillight lens
④ 4×45 cross screw
Fig. 5-24. Component parts of taillight



① Neutral lamp bulb ② Socket
Fig. 5-25. Components parts neutral lamp

5. VARIOUS LOADS

A. Headlight

The headlight is to provide safe riding at night, therefore, it should always be maintained at proper adjustment.

On the CD175/CD125, a semi sealed type lamp unit is used, whereas, a sealed type is used on the SS125A/CL125A.

On these types, deterioration rate of brightness is relatively low. **(Fig. 5-23)**

a. Malfunctions

1. Broken bulb filament
   Primary causes are :
   Excess voltage applied
   Excessive vibration due to bad roads or high speed riding
   Defective material
2. Defective contact
   Contact points making poor contact

B. Taillight, Stop Light

A combination light bulb is used for the taillight and the stoplight. The bulb rating is 6V-18/8W, the stop lamp is 18W and the tail lamp 5W. The glass enclosure is a pear shaped bulb. **(Fig. 5-24)**

b. Inspection

1. Broken filament
   The main cause of broken filament can be attributed to excessive vibration resulting from riding over bad roads or excessive voltage, however, in a rare case it can also be caused by defective material used in the manufacture of the bulb.
   Remedy : Replace the bulb.
2. Defective contact
   Bulb contacts making poor contact with the socket.
3. Broken cord
   Cause : Break at the terminal due to vibration from riding over rough road.
   Remedy : Peel back the insulation of the cord and resolder the wire to the proper terminal on the socket or connector.

C. Neutral lamp and Speedometer lamp

This lamp is to indicate the gear change to be in the neutral position and is located within the speedometer. Lamp rating is 6V-1.5W. (Speedometer lamp for SS125A/CL125A : 6V-3W) Refer to Section 1.2 for remedy in case of defective operation. **(Fig. 5-25)**

6. STARTING MOTOR

A. Description

The starting motor is comprised of the following components:

a. Field coil and pole shoe
b. Yoke
c. Armature
d. Commutator or brush
e. Power transmission device

The components from (a) through (d) are assembled within the starting motor but (e) is located outside of the starting motor, with varying degree of difference depending upon the design of the starter. Construction of a common starter is shown in **Fig. 5–26.**

The starting motor itself, if directly connected to the crankshaft, cannot turn over the crankshaft due to its high speed and low torque. In order to increase the torque of the starting motor to enable turning over the engine, a reduction gear is incorported between the starting motor and the crankshaft. The design of the reduction system is shown in **Fig. 5–27** however, the reduced sprocket shaft is assembled by the crankshaft and chain and since the crankshaft sprocket is large, this also serves as another reduction stage. An overrunning clutch is incorporated within the sprocket on the crankshaft end to disengage the starting motor from the crankshaft once the engine is started. If this unit fails to function properly, the crankshaft will motorize the starting motor to the point that it will be revolving over ten times faster than the crankshaft and the resulting centrifugal force will cause the starting motor to disintegrate.

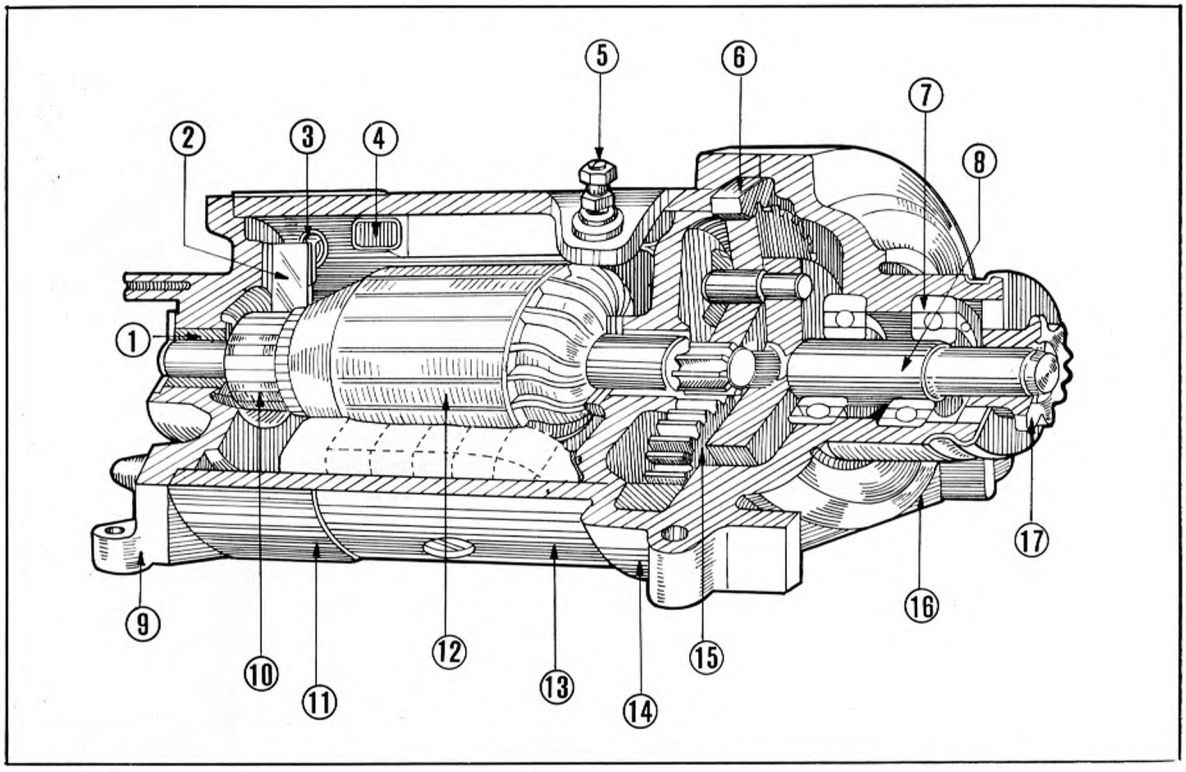
The construction of the overruning clutch is shown in **Fig. 5–28.** As the starting motor rotates, the starting chain (1) revolves in the direction of the arrow, causing the sprocket (2) to revolve. This will cause the roller (3) to move toward the narrow end of the groove formed by the sprocket and clutch outer (4) and lock the clutch outer. The generator rotor ⑦ which becomes an integral part of the clutch outer is rotated and transmits the motor rotating to the crankshaft (10) which is made an integral part of the rotor by a dowel pin (9). The roller spring (6) and the spring cap (5) function to make sure that the roller meshing is always maintained in smooth operation.

When the engine starts, the crankshaft speed gradually exceeds the speed of the sprocket, the roller, due to the centrifugal force, overrides the spring pressure and moves toward the wide section of the clutch outer, disengaging the starting sprocket and clutch outer, and preventing the engine from overriding the starting motor.

The overrunning clutch is oiled by the oil hole A shown in **Fig. 5–29.**

Starter Specification

Items	Specification
Type motor	Series wound
Operating voltage	6V
Operating current (under load)	120A
Operating current (without load)	Max 55A
Drive sprocket RPM	1650 rpm (without load)
Gear reduction ratio	5.45 : 1



① Bearing bushing ② Brush ③ Brush spring ④ Field coil ⑤ Terminal ⑥ Internal gear ⑦ Ball bearing
⑧ Sprocket shaft ⑨ Commutator end frame ⑩ Commutator ⑪ Cover band ⑫ Armature ⑬ Yoke center
⑭ Bearing holder ⑮ Planetary gear ⑯ Gear housing ⑰ Sprocket

Fig. 5–26. Construction of starting motor

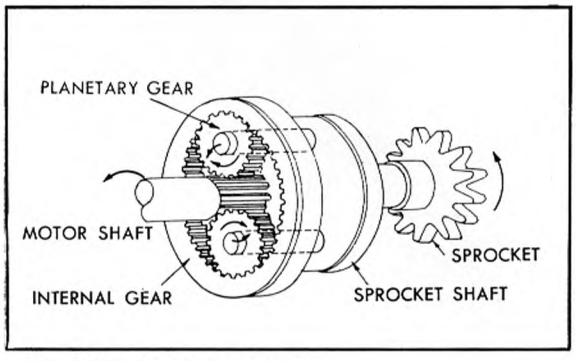


Fig. 5–27. Reduction mechanism

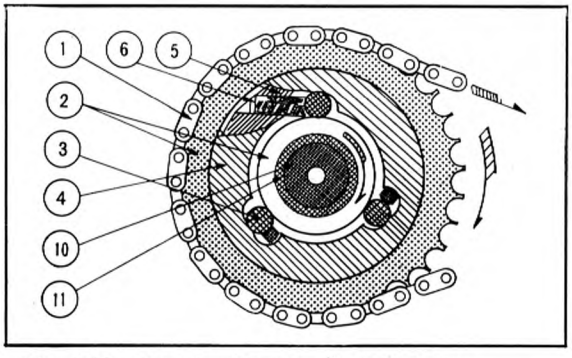
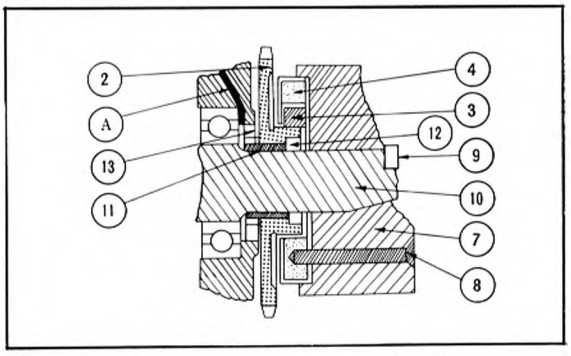


Fig. 5–28. Principle of starting clutch operation



① Starting chain ② Starting sprocket ③ Roller
④ Clutch center ⑤ Starting clutch roller spring cap
⑥ Starting clutch roller spring ⑦ A.C. generator rotor
⑧ Set screw ⑨ Dowel ⑩ Crankshaft ⑪ Bushing
⑫ Oil seal ⑬ Oil seal

Fig. 5–29. Principle of starting clutch operation

B. Disassembly

a. Removal of starting motor

1. Disconnecting the electrical power cable from the starting motor terminal.
2. Remove left crankcase cover.
3. Remove the starting motor sprocket by removing the starting chain.
4. Remove the three starting motor mounting bolts and separate the motor from the engine.

C. Inspection

1. Check the commutator for wear and if necessary, repair.
2. Check wear of the brush, if worn excessively, replace.
3. Check tension of brush spring, if there is loss of tension, replace.
4. Check the reduction gears for wear and damages, replace if necessary.
5. Check the driven sprocket, overrunning clutch spring and roller for wear and damage. Replace any defective parts.
6. Check all ball bearings and bushings for wear and damage, replace as necessary.
7. Check the operation of the starter solenoid by applying battery power to the primary terminal while grounding the solenoid body. A click will be heard for a solenoid which is in goodcondition. If the starting motor does not operate properly, the solenoid contact points may be in poor condition. Disassemble the solenoid and clean the points with a fine file.

D. Reassembly

Reassemble the starting motor and overrunning clutch in the reverse order of removal.

(Note)

Apply a thin coating of silicone grease to the overrunning clutch rollers during assembly.

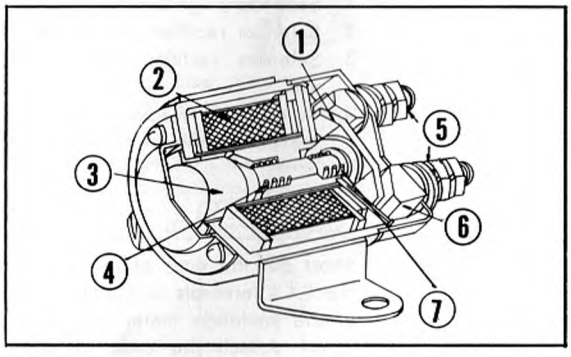
7. STARTING MAGNETIC SWITCH

During the starting period a high surge current of approximately 100A is required to produce the high starting torque. In order to do this it will require a heavy switch and also heavy cabling, and since this would not be feasible, a heavy magnetic switch is employed. This high current is passed from the battery to the starter by the way of the magnetic switch with a remote control being used to control the magnetic switch.

Construction of the magnetic switch is shown in **Fig. 5–30.** When the current is passed through the primary coil, a magnetic field is set up which draws the moving core overriding the spring. This causes the contact on the end of the core to close the secondary terminals and supplies current to the starting motor.

When the moving core closes the secondary terminals, a heavy clicking sound should be heard to indicate the operation of the magnetic switch. If the starting motor does not revolve, either the contacts are burnt or else the contact point are not making good contact, or there may be trouble in the starting motor. The defective motor can be determined by connecting the motor directly to the battery. If the motor is not defective, disassemble the magnetic starting switch and clean the contact points with a sandpaper.

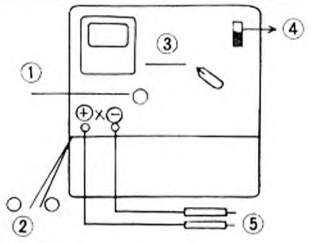
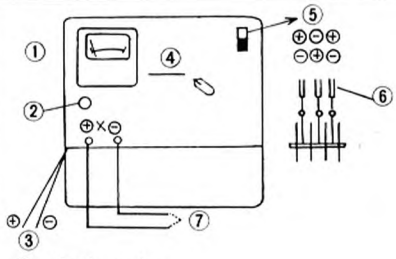
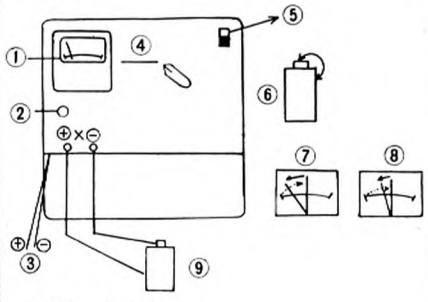
When depressing the starter switch does not produce any sound in the starter switch, button is defective.

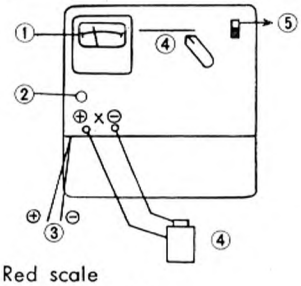
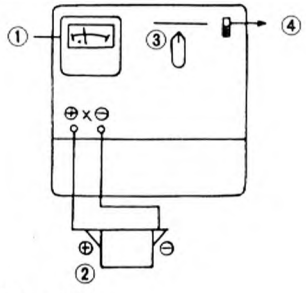
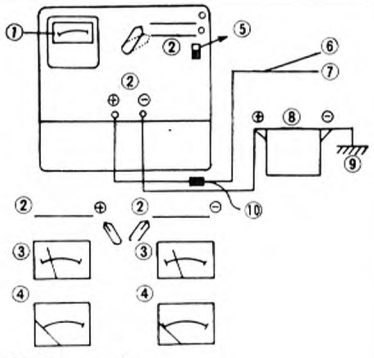


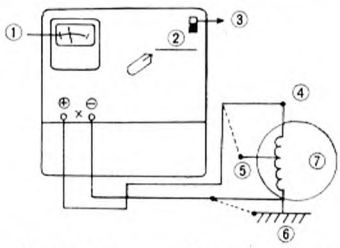
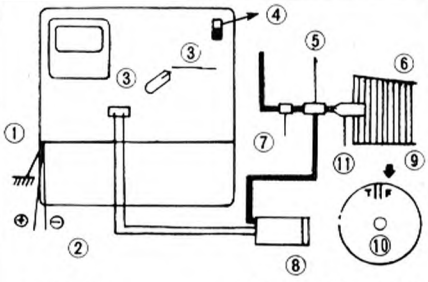
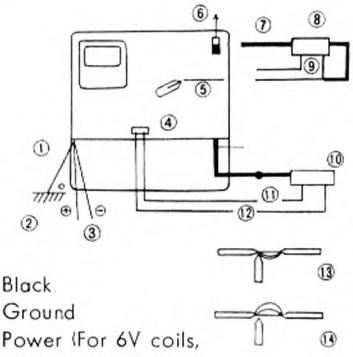
① Contactor (Moving side)
② Solenoid coil (Primary coil)
③ Core
④ Return spring
⑤ Terminals
⑥ Contactor (Fixed side)
⑦ Contactor return spring

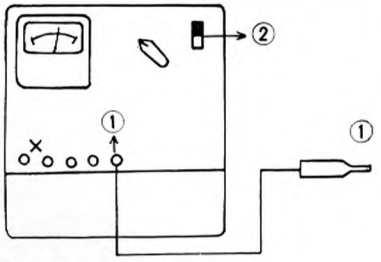
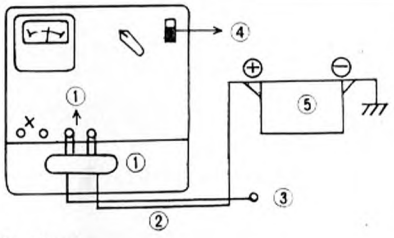
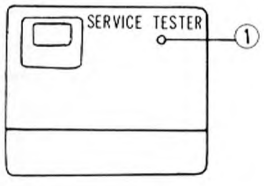
Fig. 5–30. Construction of starting magnetic switch

7. SERVICE TESTER INSTRUCTION

Item	Power	Direction for Use	
Continuity test	6 or 12 volts	Connect the test leads to the "X" terminals and attach the ends of the test leads to the part to be tested. If there is continuity, the red "Continuity" lamp will be lit. No lighting indicates that there is no continuity. Examples : 1. Light bulbs, shorted or open electrical circuit. 2. Many other electrical continuity tests can be performed.	 ① Continuity lamp ② Power (6V or 12V) ③ Continuity ④ ON / OFF turn the switch off ⑤ Test lead
Resistance test	6 or 12 volts	Short out the ends of the test leads connected to the "X" terminals and adjust the indicator needle of the resistance meter to "O" by the adjusting knob. Attach the ends of the test leads to the points across which the resistance is to be measured and read the meter indication. Examples : 1. Secondary ignition coil, 5,000–10,000 ohm 2. Selenium rectifier normal direction, 5–40 ohm 3. Selenium rectifier reverse direction, 600 ohm min. 4. In addition, measurement of resistance across the points and many other uses.	 ① Black scale ② Adjusting knob ③ Power (6V or 12V) ④ Resistance ⑤ Turn the switch off ⑥ Test lead ⑦ Short (Adjust the needle to "O")
Insulation test	6 or 12 volts	Short out the ends of the test leads connected to the "X" terminals and adjust the indicator needle of the insulation meter to "O" by the adjusting knob. Attach the ends of the test leads across the points to be measured, the insulation value is indicated on the meter. Examples : 1. Condenser insulation value : Under 1M ohm . . . . defective Over 5M ohm . . . . satisfactory 2. Various insulation tests may be performed.	 ① Black scale ② Adjusting knob ③ Power (6V or 12V) ④ Insulation ⑤ Turn the switch off, discharge after the measurement ⑥ Condenser, Short out the terminals to discharge ⑦ Over 5M ohm. . . . . satisfactory ⑧ Under 1M ohm. . . . . detective ⑨ Condenser

Item	Power	Direction for Use	
Condenser capacity test	6 or 12 volts	With the initial resistance adjust the indicator needle of the meter to "O" by the adjusting knob and position the switch to "Condenser". Attach the ends of the test leads to the test condenser terminals and read the capacity on the meter. Range of measuring value : 0.3~0.3μF	 ① Red scale ② Adjusting knob ③ Power (6V or 12V) ④ Condenser ⑤ Turn the switch
D.C. voltage measurement	Not required	Attach the red test lead from the "X" terminal to the ⊕ side and the black test test lead from the "X" terminal to the ⊖ side of the test part and read the measurement on the meter. Examples : 1. Battery terminal voltage 2. Measuring the output of the D.C. dynamo	 ① Blue scale ② Battery ③ D.C. voltage ④ Turn the switch off
D.C. current Ⓘ ⊕	Not required	Connect the D.C. current measuring leads to the D.C. current terminals. When the current flows from the red terminal to the black terminal, the indicator needle on the meter swings to the normal direction. If the indicator needle swings in the reverse direction, the connection at the D. C. connection must be reversed. **. (Caution)** If the connections are reversed, fuse (15A) will be blown. When the indicator needle of the meter does not swing, inspect for fuse. Example 1. The charge or discharge condition of the battery. 2. Measuring the current consumption of the flasher, horn, light, etc.	 ① Yellow scale ② D.D. current ③ Charge ④ Discharge ⑤ Turn the switch off ⑥ Switch ⑦ Selenium rectifier ⑧ Battery ⑨ Mounted on chassis ⑩ 15A fuse

Item	Power	Direction for Use	
A.C. voltage measurement	Not required	Attach the ⊕ test lead from the "X" terminal to the ⊕ side of the dynamo (A.C.) either day or night operation and the ⊖ test lead to the ⊖ side or to the chassis and measure the voltage with the engine running. **(Caution)** Do not run the engine at high speed. Measure at a speed below 2,000 rpm.	 ① Blue scale ② A.C. voltage ③ Turn the switch off ④ Day ⑤ Night ⑥ Chassis ⑦ Dynamo (A.C.)
Timing test	6 or 12 volts	Plug in the timing light attachment into the timing receptacle. Next, attach the timing light high tension cord to the hex bar installed on the head of the spark plug. Position the switch to "Timing", start the engine and the timing light will start flashing. Point the light to the flywheel adjacent to the case timing index mark. The ignition timing and spark advancing can be inspected.	 ① Earth ② Power 6V or12V ③ Timing ④ The switch may be turned either ON or OFF ⑤ Hex bar ⑥ Engine ⑦ Plug cap ⑧ Timing light ⑨ Ignition timing alignment mark ⑩ Rotor
Coil test	6 or 12 volts	Plug the crow foot plug into the crow foot receptacle to connect the primary coil, and connect the red test lead to the ⊕ side of the primary coil and the white test lead to the ⊖ side. Then, connect the high tension cord from the upper RH corner of the pocket in the tester body to the high tension secondary coil. Position the switch to "Coil Test" and the spark will jump across the three needle test gap. Measure the spark gap by turning the adjustment knob. **(Caution)** Ground the black cord in the upper LH pocket of the tester body to avoid possible electric shocks during the test. For 6V coils, use 6 volts power and 12 volts power for 12V coils.	 ① Black ② Ground ③ Power (For 6V coils, use 6V power and use 12V power for 12V coils) ④ Primary coil ⑤ Coil test ⑥ The switch may be turned either ON or OFF ⑦ High tension secondary (For simultaneous ignition) ⑧ Coil ⑨ Primary coil ⑩ For common use ⑪ Red ⑫ White ⑬ Normal ⑭ Reverse

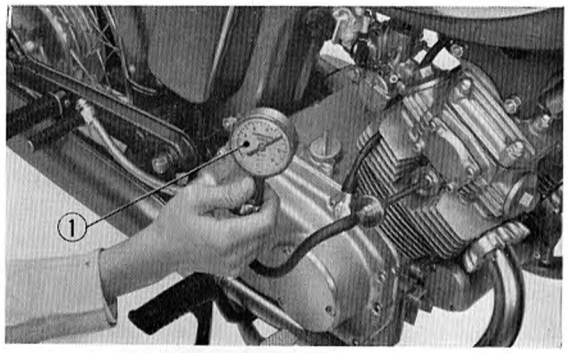
Item	Power	Direction for Use	
Transistor tachometer unit attachment	Not required	Use the transistor tachometer unit attachment in the timing test started above for measuring the revolution of the engine, the revolution for the charge starting and the revolution for the governor advancing, etc. 0～6,000 rpm.	 ① Tachometer ② Turn the switch on
Shunt unit attachment	Not required	The shunt unit attachment is used for measuring the starter current, the current under no load and for testing the selfstarting motor performance 0～60A	 ① Shunt ② Wiring diagram for starter current measurement ③ Starter cord ④ Turn the switch off ⑤ Battery
Caution	1. The service tester shall be operated with care and the switches turned off when not in use. 2. When the power indicator lamp is not lit with the battery connected, the probable causes of the trouble are either blown fuse or defective vibrator. Inspect the parts. 3. When using the timing light, if the service tester is operating but the timing light is not lit, the bulb (xenon tube) is probably defective and should be replaced.		 ① Power indicator lamp

MEMO

6. PERIODIC ADJUSTMENT

6.1 MAINTENANCE INSPECTION

Periodic inspections should be performed at regular schedule and designated mileages in order to obtain satisfactory service as well as to extend the useful life of the motorcycle.



① Compression gauge
Fig. 6–1. Measuring compression pressuer

A. ENGINE ADJUSTMENT

1. MEASURING COMPRESSION

A low compression pressure will result in a corresponding drop in the engine power putput. Pressure leak from any source may effect the engine speed adjustment at low speed and create engine stall condition.

a. Remove the spark plug.

b. Insert the end of the compression gauge into the spark plug hole and hold firmly to prevent pressure from leaking. **(Fig. 6–1)**

c. Operate the kick starter repeatedly several times with both the choke and throttle in the full open position.

(Note)

1. Make sure that the throttle and choke are fully open, or else, a lower pressure indication will be registered on the compression gauge.
2. The cylinder compression pressure indication will gradually increase with each kick, therefore, continue kicking until the pressure stabilizes at the highest point.
3. To obtain a true cylinder pressure indication, the measurement should be made after the engine attains operating temperature.
4. Check for the proper operation of the valves.
5. Make sure that the compression gauge is firmly fitted in the spark plug hole to prevent pressure leak.

d. The normal cylinder compression pressure is 10 kg/cm^2 (142.3 lb/in^2).

e. In case the compression pressure exceeds 12 kg/cm^2 (172 lb/in^2), it is an indication of heavy carbon deposit accumulation on the cylinder head or the piston. The deposits should be removed by disassembly-ing the cylinder head from the cylinder.

f. When the compression pressure registers less than 8 kg/cm^2 (114 lb/in^2), it is an indication of pressure leak. First check the tappet adjustment and see if the condition can be corrected, disassemble the engine and inspect the condition of the valves, the head gasket and piston rings.

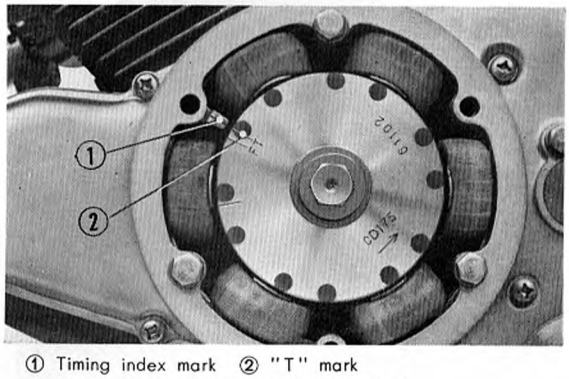
2. TAPPET ADJUSTMENT

The tappet clearance will have a great deal of effect on the valve timing. If the clearance is too small, it may prevent the valve from fully closing and result in pressure leak at the valve. On the other hand, an excessive tappet clearance will produce tappet noise and result in noisy engine operation. The tappet clearance will also have a varying degree of effect on the engine power output, engine operation at slow speed and engine noise.

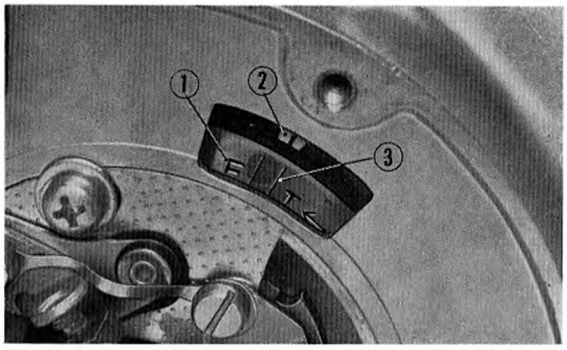
1. Valve clearance

a. Remove the left crankcase cover and align the "T" timing mark on the A.C. generator rotor with the timing index mark on the stator. **(Fig. 6–2–1)**
For the 125cc types, remove the contact breaker cover and align the "T" mark on the generator rotor with the timing index mark. **(Fig. 6–2–2)**

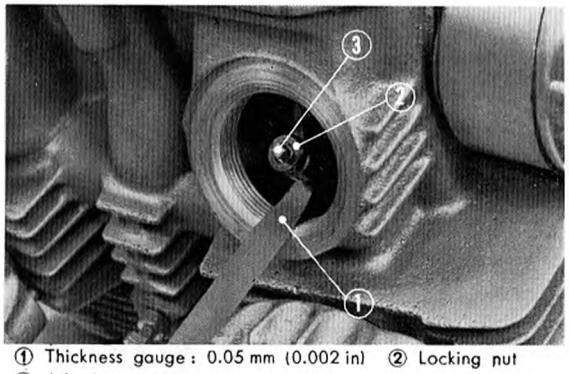
b Unscrew the tappet adjusting cap on the cylinder head and check the clearance between the adjusting screw and the valve with a thickness gauge. **(Fig.6–3)**



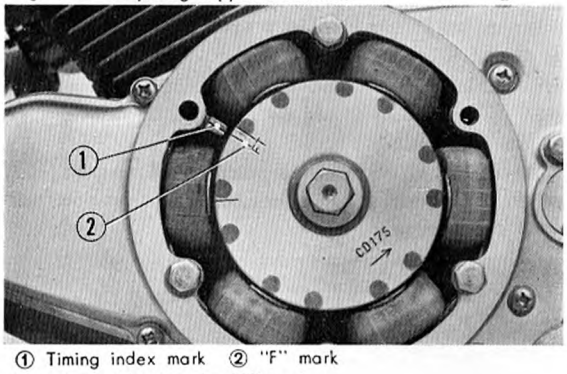
① Timing index mark ② "T" mark
Fig. 6–2–1. Aligning the "T" timing mark



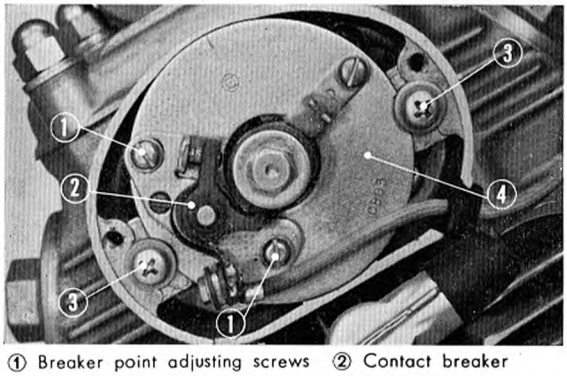
① 'F" mark ② Timing index mark ③ "T" mark
Fig. 6–2–2. Aligning the timing marks



① Thickness gauge : 0.05 mm (0.002 in) ② Locking nut
③ Adjusting screw
Fig. 6–3. Adjusting tappet clearance



① Timing index mark ② "F" mark
Fig. 6–4. Aligning the "F" mark



① Breaker point adjusting screws ② Contact breaker
③ Contact base plate screws ④ Contact base plate
Fig. 6–5–1. Adjusting the ignition timing

If the valve is being actuated by the rocker arm, rotate the A.C. generator rotor one complete revolution to set the piston at top-dead-center of the compression stroke, and then perform the check.

2. Adjustment

Loosen the adjusting screw locking nut and make the adjustment with the adjusting screw to obtain the standard clearance of **0.05 mm (0.002 in.)** for both the inlet and exhaust valves. Turn screw clockwise for closer clearance. **(Fig. 6–3)**

(Note)

1. The adjustment must be made with a cold engine and the clearance measured with a thickness gauge.
2. When locking the adjusting screw, hold the screw to prevent its turning.

3. Inspection

a. Check to make sure that the tappet clearance is within standard tolerance. Too small a clearance will cause the valve to stay open with a consequent pressure leakage which will result in hard starting or no starting at all.
b. Check for improper valve timing.
c. Check for stretch in the cam chain.

3. IGNITION TIMING ADJUSTMENT

An improper ignition timing, regardless of the accuracy of the valve timing or the proper compression pressure, will not realize a satisfactory engine performance. Ignition timing out of adjustment will seriously affect engine power output as well as the fuel consumption.

1. Alignment of the "F" timing mark

a. Remove the left crankcase cover remove the contact breaken cover for CD125/A, SS125A, CL125A) and align the "F" marking on the generator rotor to the timing index mark on the stator. Check to make sure that the spark is produced across the spark plug gap at this point. **(Fig. 6–4)**

Perform this test by removing and placing the spark plug on top of the cylinder head with the high tension case connected.

2. Adjustment

Make the adjustment if required, by loosening the contact breaker point adjusting screws.

- ○ When the ignition timing is retarded, move contact breaker toward the right.
- ○ When the ignition timing is advanced, move the contact breaker toward the left.

3. Breaker point gap, 0.3 to 0.4 mm (0.012–0.016 in.) max.

Improper ignition timing will result in combustion to take place at the incorrect point of compression, making it impossible to obtain smooth engine operation. The throttle will require greater opening, consequently, the fuel consumption is increased.

Results of retarded ignition timing :

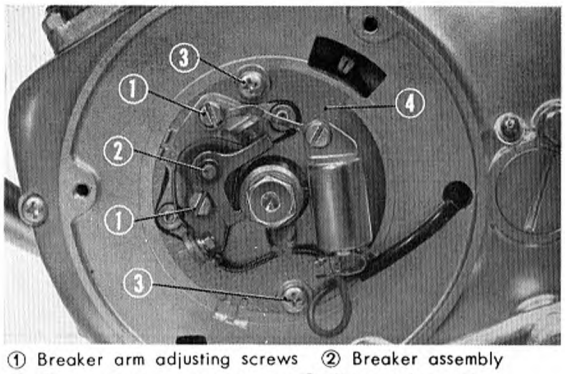
1. Drop in power output.
2. Drastic increase in fuel consumption.
3. Engine overheats with a possibility of piston seizure.

Results of advanced ignition timing :

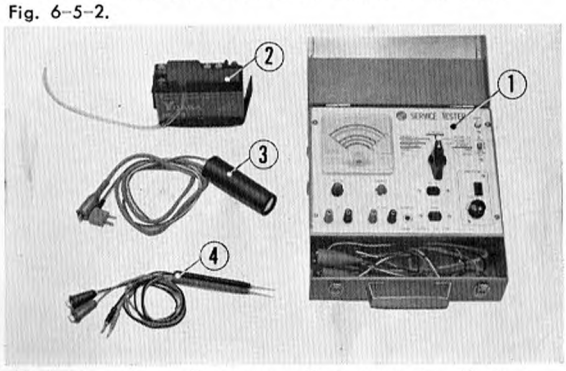
1. Produces knocking and drop in power output. In severe cases, damage to piston, connecting rod, crankshaft may result, therefore, periodic inspection should be performed.
2. Upon completion of the point gap and ignition timing adjustment, check for proper operation of the spark advancer by the use of a timing light.

   Checking the operation of the spark advancer with a tachometer.

Refer to section on service tester, page 145.



① Breaker arm adjusting screws ② Breaker assembly
③ Contact base plate screws ④ Contact base plate
Fig. 6–5–2.



① Service tester ② Battery ③ Timing light ④ Cord
Fig. 6–6. Ignition timing tester

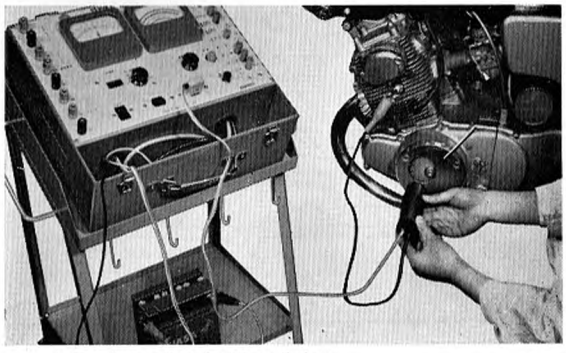
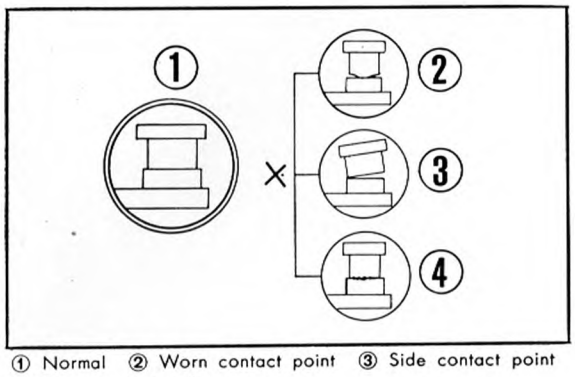
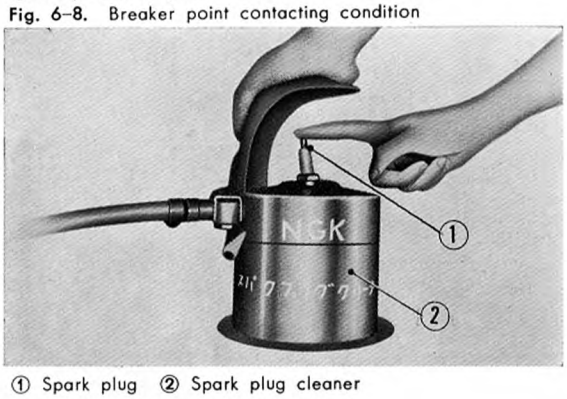


Fig. 6–7. Inspecting ignition timing



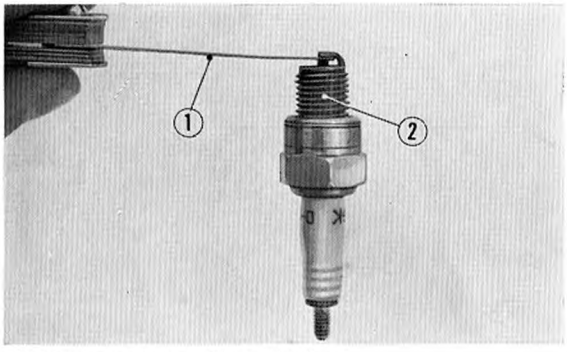
① Normal ② Worn contact point ③ Side contact point
④ Dirty contact point

Fig. 6–8. Breaker point contacting condition



① Spark plug ② Spark plug cleaner

Fig. 6–9. Cleaning the spark plug



① Thickness gauge ② Spark plug

Fig. 6–10. Adjusting the spark plug gap

4. CONTACT POINTS

Inspect the surfaces of the contact points; if they are burnt or pitted, dress the surface with an oilstone or a point dressing file so that the points are making parallel contact. **(Fig. 6–8)**

After the points have been dressed, wash in gasoline or trichloroethylene to remove all trace of oil.

Insufficient breaker point gap.

a. The spark tends to linger, that is the interruption of the primary circuit is not completed at the points, therefore, the secondary high voltage build up is reduced.
b. The closed duration of the points is longer, producing heat and result in damage to the points.
c. In conjunction with ⓑ above, the points will be late in opening with a consequent delay in the ignition timing; this will cause a drop in power output.

Excessive breaker point gap.

a. The duration that the points are closed is too short to allow for sufficient current flow in the primary circuit with a consequent low voltage build-up in the secondary high voltage circuit. This condition will cause poor engine starting, ignition missing at high speed and resulting in loss of power.
b. Engine over-heats readily.
c. The ignition timing is advanced.

5. SPARK PLUG ADJUSTMENT

A dirty or damaged spark plug or plug electrode which are eroded will not produced a good strong spark, therefore, the spark plug should be inspected periodically and cleaning and adjustment made. Spark plug with sooty wet electrodes, or electrodes covered with deposits will permit the high tension voltage to bridge the gap without sparking.

1. Cleaning

a. The use of the spark plug cleaner is the recommended method of cleaning the plugs, however, a satisfactory cleaning can be performed by using a needle or a stiff wire to remove the deposits and then wash in gasoline followed by drying with a rag or compressed air. **(Fig. 6–9)**
b. Adjust the spark gap after cleaning. Set the gap to **0.6–0.7 mm (0.024–0.028 in)** by bending the electrode on the ground side. **(Fig. 6–10)**

Spark Plug Inspection

a. Check the spark intensity produced between the gap of the ground and the center electrodes by observing the color.

Blue spark.....Good condition
Red spark .....Poor condition

Cause of poor spark :

1. Low supply voltage
2. Defective ignition coil
3. Defective spark plug
4. Absence of sparking may also be due to compression

(Note)

1. Do not remove the deposits by burning.
2. When installing the spark plugs, clean the seating area free of oil or foreign matter and install finger tight before torquing with a plug wrench.
3. The spark plugs can be tested after adjustment with the plug tester. With the high tension voltage maintained constant, vary the test chamber pressure and observe the condition of the spark.

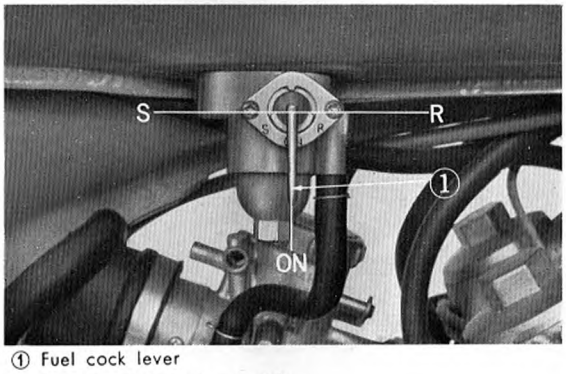
6. FUEL SUPPLY SYSTEM

Restriction in the fuel supply system will prevent sufficient fuel flow to the carburetor and cause engine to sputter during acceleration or the engine may stall at high speed.

a. Check for sufficient supply of fuel in the tank.
b. Disconnect the fuel feed tube from the carburetor and check the fuel flow with the fuel cock in the ON or the RES position. **(Fig. 6–11)**
c. If the fuel flow is insufficient, remove the fuel tank from the body and clean internally. When the flow is still inadequate, remove the fuel cock, disassemble and clean.

(Note)

1. The insufficient fuel flow may be caused by the plugged vent hole in the filler cap as well as the restriction in the fuel line. **(Fig. 6–12)**
2. The fuel cock is switched to RES (reverse) from the ON position when the fuel tank becomes empty. The reverse fuel supply contains approximately **2.0 ℓ (4.2 U.S. pt., 3.5 Imp pt.)**
   SS125A : 1.8 ℓ (3.8 U.S. pt., 3.2 Imp pt)
   CL125A : 2.0 ℓ (4.2 U.S. pt., 3.5 Imp pt)
d. Fuel strainer cleaning
   The accumulation of dirt and water in the fuel cock strainer cup will cause a restriction in fuel flow, resulting in drop in engine speed and malfunction of the carburetor. Clean the cock, strainer and the filter screen at periodic interval.



① Fuel cock lever

Fig. 6–11. Fuel cock assembly

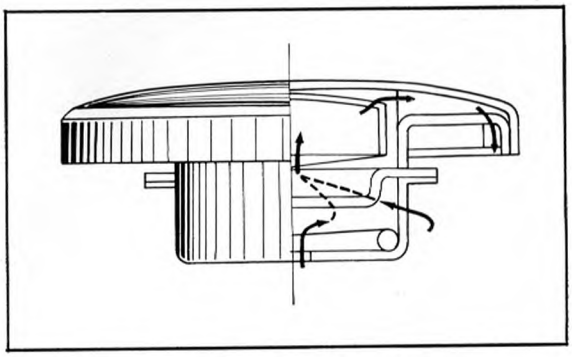
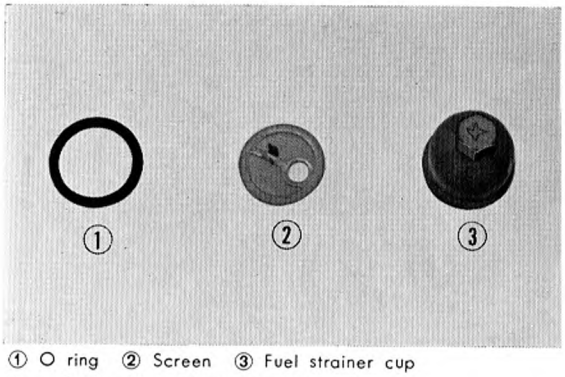


Fig. 6–12. Sectional view of the fuel tank cap



① O ring ② Screen ③ Fuel strainer cup
Fig. 6–13. Cleaning the fuel strainer

7. FUEL STRAINER CLEANING

The foreign substances contained in the fuel passes through the fuel line from the fuel tank and enters the strainer cup. The foreign substances and water, if not arrest in the strainer cup will enter the cylinder and causes engine malfunction.

1. Cleaning

a. Set the fuel cock lever to the STOP position.
b. Remove the strainer cup.
c. Clean inside the strainer cup and filter screen.

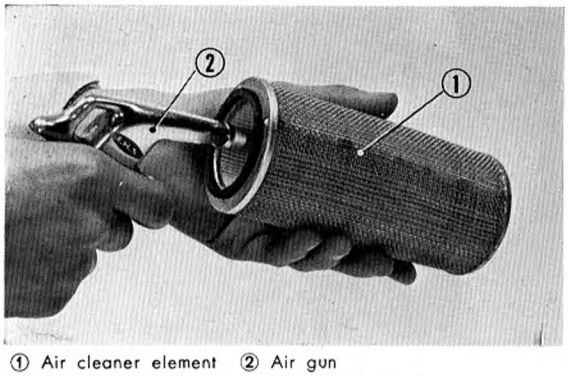
(Fig. 6–13)

8. OIL FILTER SCREEN CLEANING

The engine oil is filtered through a system of double filters, the centrifugal rotor oil filter and the pump filter screen before being supplied to the various parts of the engine. When the impurities have accumulated in the filters to prevent its proper function, the oil supply to the various parts are starved and eventually result in seizure and damage to the engine. It is therefore, important that the filters be cleaned periodically.

1. Cleaning

Remove the right crankcase oil filters cover to get access to the rotor oil filter and for access to the pump filter screen, remove the right crankcase cover. Clean the units in gasoline.



① Air cleaner element ② Air gun
Fig. 6–14. Cleaning the air cleaner element

9. AIR CLEANER SERVICING

An air cleaner clogged with dust restricts the free passage of inlet air and result in power loss or drop in acceleration, therefore, to assure proper performance, periodic cleaning of the air cleaner should be made.

1. Removal

Remove the seat to get access to the air cleaner.

2. Cleaning

Tap the air cleaner lightly to loosen the dust and then blow dry compressed air from the inside or use a brush. **(Fig. 6–14)**

(Caution)

1. The air cleaner is made of paper and if torn or damaged, will cause dust to enter the engine cylinder, resulting in increased cylinder wear, therefore, replace with a new element.
2. Oil or water on the cleaner element will render it ineffective by restricting the flow of air and causing a drop in power.

10. CARBURETOR CLEANING AND ADJUSTMENT

A dirty carburetor or carburetor out of adjustment will cause poor engine performance. As an example, a carburetor set to a lean fuel air mixture will cause the engine to overheat while a rich mixture will cause engine to run sluggish. Further, overflowing of fuel from the carburetor is a possible fire hazard, therefore, periodic cleaning and adjustment should be performed.

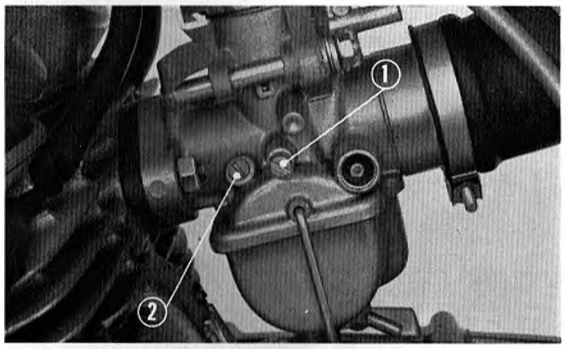
1. Cleaning

a. Disassemble the carburetor and wash the parts in gasoline.
b. Blow out the nozzles with compressed air and after cleaning and reassembly, make the adjustment.

2. Idle adjustment

The idle adjustment is performed with both the throttle stop screw and the air screw by the following procedure. **(Fig. 6–15)**

a. Set the throttle stop screw to the specified idling speed **(1000–1200 rpm)** (SS125A, CL125A: 850 rpm).
b. Next, adjust the air screw by turning slowly in both directions to obtain the highest engine speed. Turning the screw in will produce a rich fuel mixture.
   Turning the screw out will produce a lean fuel mixture.
c. Reduce the engine speed which has gone up in ② to the specified RPM by regulating the throttle stop screw.
d. At this throttle stop screw setting, recheck the carburetor adjustment man ipulating by the air screw.
e. After the idling adjustment has been completed, check the carburetor by snapping throttle and also check the throttle response.



① Throttle stop screw ② Air screw
Fig. 6–15. Adjusting the carburetor

(Note)
All adjustment should be made after the engine has attained operating temperature.

B. LUBRICATING

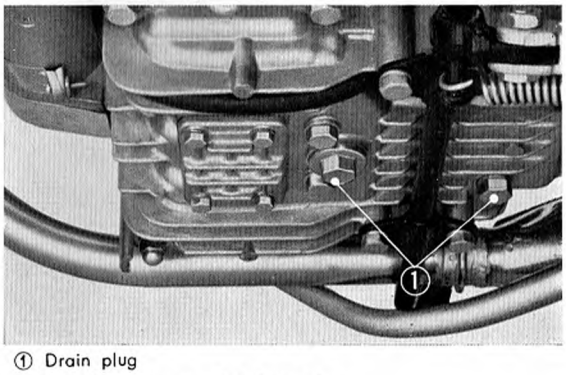
The purpose of lubrication is to prevent direct surface to surface contact of the moving parts by providing a film of oil betwen the surfaces and thereby, reducing friction and preventing wear. It also serves to cool the parts from the heat produced by friction.

Further, the lubricant penetrates between the piston and cylinder to form an oil film which act as a seal to maintain the cylinder pressure.

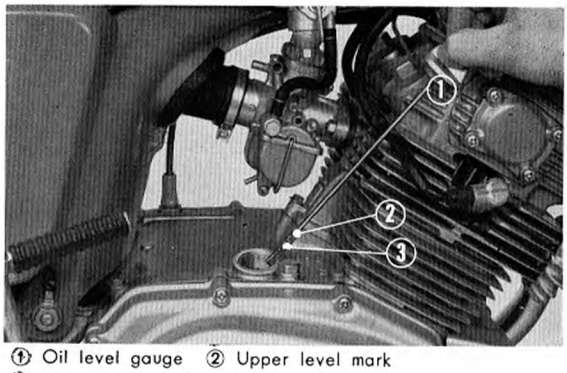
1. PARTS NOT REQURING PERIODIC OIL CHANGE OR LUBRICATION

There are some parts which only require lubrication whenever the components are disassembled for repair or replacement.

Steering stem steel balls and cone race, Throttle grip, Main stand } Grease



① Drain plug
Fig. 6–16. Removing the drain plug



① Oil level gauge ② Upper level mark
③ Lower level mark
Fig. 6-17. Oil level gauge

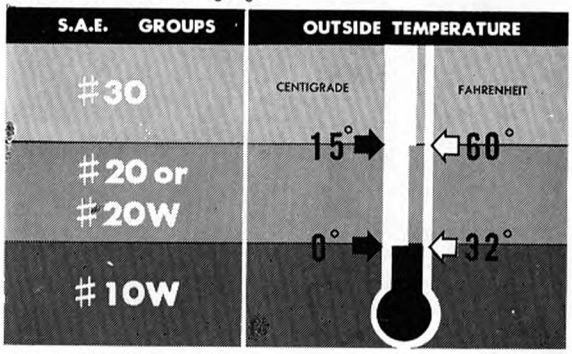
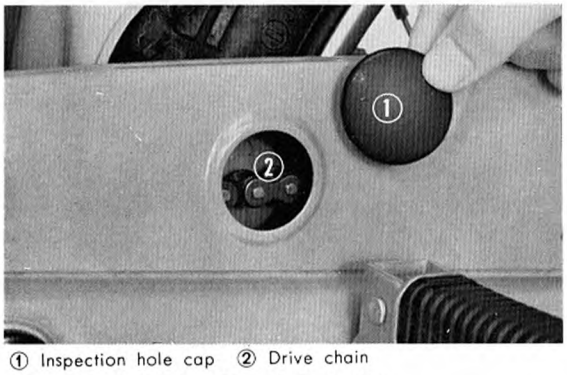
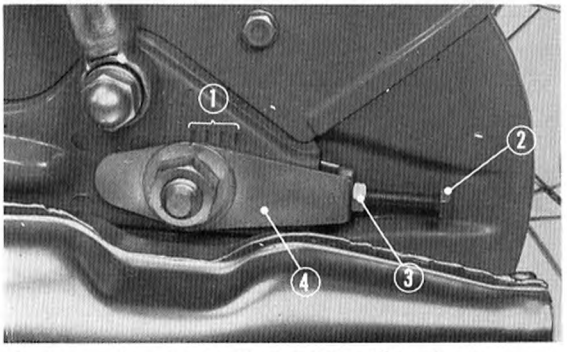


Fig. 6-18. Oil viscosity



① Inspection hole cap ② Drive chain
Fig. 6-19. Inspecting drive chain tension



① Alignment mark ② Adjusting bolt ③ Lock nut
④ Adjuster
Fig. 6-20. Adjusting the drive chain

2. ENGINE OIL CHANGE

Change oil at initial **300 km (185 miles)** and at every **1000 km (620 miles)** thereafter.

1. Oil change

a. Remove the oil cap and drain the engine completely of oil by unscrewing the plug at the bottom of the engine. **(Fig. 6-16)**

(Note)

The oil shoule be drained while the engine is still warm. This will save time and assure proper draining.

b. The proper oil level is indicated by the oil level markers on the gauge when checked without screwing the cap down. **(Fig. 6-17)**

Oil capacity

CD175 : 1.5 ℓ (3.2 U.S. pt., 2.7 Imp pt)

CD125A, SS125A, CL125A :

1.2 ℓ (2.5 U.S. pt., 2.1 Imp pt)

Oil type and grade

The grade of oil for the season is shown in the plate on the upper crankcase. Use the oil corresponding to MS. DG in the A.P.I. service classification. **(Fig. 6-18)**

Under 0°C (32°F)..... SAE 10W

0°~15°C (32°~60°F)... SAE 20W

Over 15°C(60°F) ..... SAE 30

(Note)

1. Oil plays a prominent role in the life and the trouble free performance of an engine, therefore, it is very important that the oil change be performed periodically and refrain from using dirty oil over a long period. The more frequent the oil change, the better it is for the engine.
2. When refilling or adding oil, it should not be filled above the specified level. Overfilling will cause oil pumping with consequent fouling of the spark plug.
3. Use only recommended oil of proper grade.

C. DRIVE CHAIN ADJUSTMENT

An excessively slack drive chain will cause chain to whip, whereas, an over-tension condition will produce resistance, resulting in lower power output at the rear wheel. Always maintain the chain at the specified tension.

1. Tension checking procedure

a. Remove the inspection cover on the chain case and check to see if the total vertical slack of the chain is between **1-2 cm (0.40-0.80 in). (Fig. 6-19)**

b. Perform adjustment by loosening the axle nut and sleeve nut and then adjust with the adjusting bolts. **(Fig. 6-20)**

Turn to the right to decrease chain slack.

Turn to the left to increase chain slack.

(Note)

The adjusters should be at the same alignment marks for both both the right and left sides.

c. Periodically clean and lubricate the chain.

Lack of oil will cause the chain links to bind and cause undesirable effect on the sprocket.

D. BRAKE ADJUSTMENT

Brakes are the life-line of the rider, therefore, do not neglect to perform the periodic, daily, and the pre-riding inspections.

1. FRONT BRAKE ADJUSTMENT

1. Lever free play

a. The free play of the brake lever, that is, the distance between the normal attitude and the point where the brake starts to take hold should be **2–3 cm (0.73–1.12 in). (Fig. 6–21)**

b. Adjustment is made by the adjusting nut. **(Fig. 6–22)**
Turn to the right to decrease the free play.
Turn to the left to increase the free play.

2. REAR BRAKE ADJUSTMENT

1. Pedal free play

a. The free play of the brake pedal, that is the distance between the normal attitude and the point where the brake starts to take hold should be **2–3 cm (0.78–1.12 in). (Fig. 6–23)**

b. Adjustment is made by the adjusting nut. **(Fig. 6–24)**
Turn to the right to decrease pedal play.
Turn to the left to increase pedal play.

c. When the braking stroke is small, one or more of the following conditions are apparent.
1) Too small a clearance between brake panel and shoe.
2) Loss of tension in the brake spring.
3) Brake lining damaged due to overheating.

E. SPOKE TORQUING

Riding with loose spoke will place an ununiform loading on the rim as well as on the remaining spokes, therefore, the spokes should be inspected frequently and retorqued when they become loose.

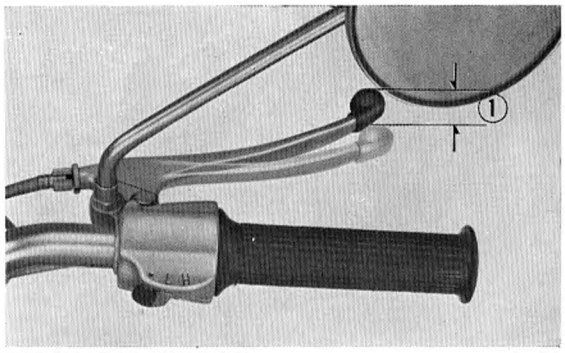
Raise the wheel off the ground and check each spoke for tightness, any spoke which are noticeably loose should be torqued to the same value as the remaining spokes so that the spokes are all of uniform torque. Use the spoke nipple tool and torquing wrench.

F. BATTERY INSPECTION

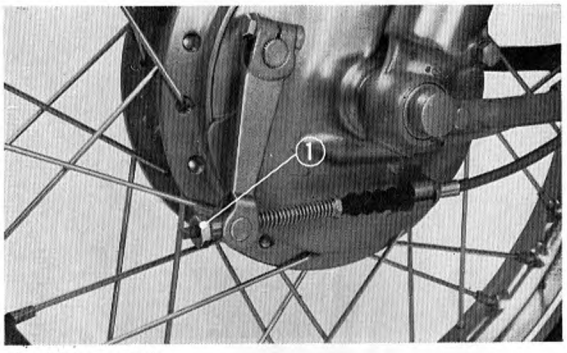
Loss of battery electrolyte occurs after long use and should be replenished periodically. When the electrolyte level drops to the point where the plates are exposed, it will result in rapid discharge to the battery. The battery, should always be maintained at the proper electrolyte level.

1. Electrolyte level

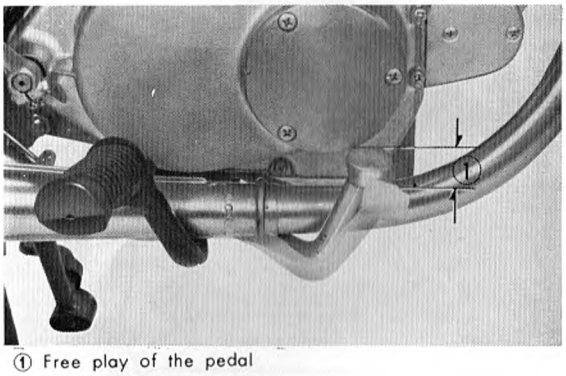
a. Remove the battery box, disconnect the battery cable from the battery, unfasten the battery band and remove the battery.



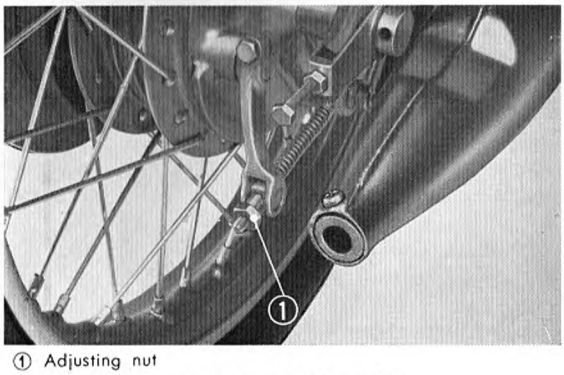
① Free play of the lever
Fig. 6–21



① Adjusting nut
Fig. 6–22. Adjusting the front brake lever



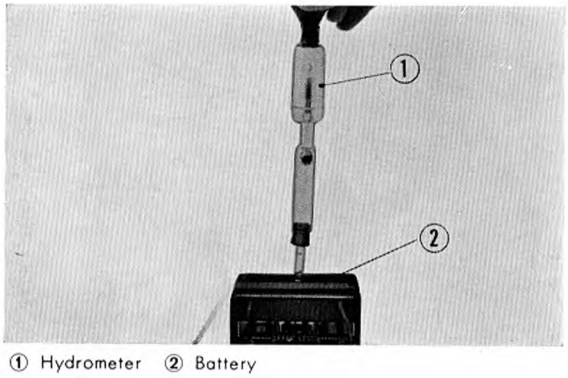
① Free play of the pedal
Fig. 6–23.



① Adjusting nut
Fig. 6–24. Adjusting the rear brake pedal



① Upper level mark ② Lower level mark
Fig. 6–25. Battery electrolyte level



① Hydrometer ② Battery
Fig. 6–26. Measuring specific gravity

b. Always maintain the electrolyte level above the lower electrolyte level marking on the battery. When replenishing, add distilled water to raise the electrolyte level to the upper marking. **(Fig. 6–25)**

c. Replenish by unscrewing the battery cap at the top and add the distilled water. All three battery cells should be filled to the same level.

2. Damaged and dirty battery cable connector

Inspect the connectors for cleanliness and damage. Clean the dirty connectors or replace damaged connectors before marking connection and apply a coating of grease or vaseline on the connectors to prevent corrosion.

3. Specific gravity

Check the specific gravity of all three cells of the battery with a hydrometer, if it measures below **1.200,** the battery should be changed.
A fully charged battery should indicate a specific gravity of 1.28 at electrolyte temperature of **20°C (68°F).**

The specific gravity will vary somewhat with the temperature. A rise in temperature will cause a decrease in specific gravity at the rate of 0.00017 specific gravity variation for each 1°C (1.8°F) and vica versa. **(Fig. 6–26)**

(Caution)

1. Do not add any sulfuric acid to the distilled water when replenishing.
2. When the drop in electrolyte level is excessive, check the discharge rate of the battery.
3. Exercise care not to pinch the battery cable when making the battery installation.
4. Also, make sure that the vent tube is not pinched.
5. When the temperature drops, the capacity of the battery will lower and cause hard starting. In such a case, store the motorcycle in a warm place.

G. SECURITY INSPECTION OF PARTS

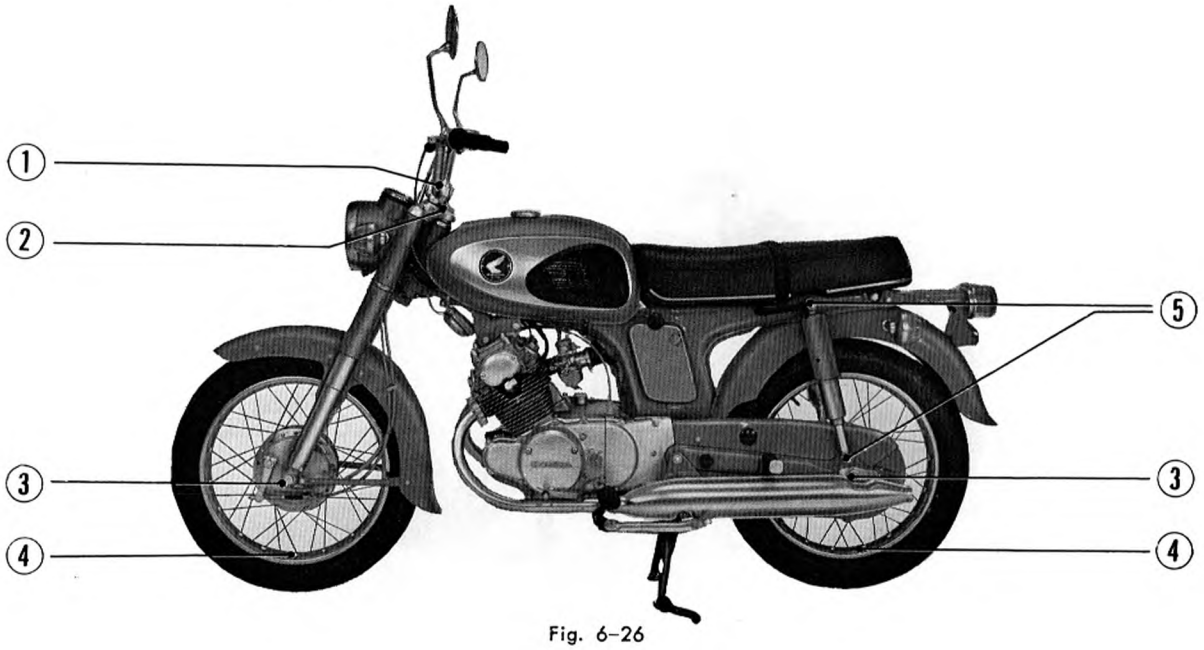


Fig. 6-26

①	Handle installation nut	150~250 kg-cm (10.1~18.1 ft. lbs)
②	Steering stem nut	900~1,200 kg-cm (72.3~86.8 ft. lbs)
③	Front and rear axle nuts	700~900 kg-cm (50.6~72.3 ft. lbs)
④	Wheel spokes	15~20 kg-cm (1.0~1.5 ft. lbs)
⑤	Rear cushion upper and rear nuts	350~450 kg-cm (25.3~32.5 ft. lbs)
⑥	Rear fork pivot bolt	500~600 kg-cm (36.1~43.4 ft. lbs)
⑦	Engine hanger bolts	8 mm : 200~300 kg-cm (15~21.7 ft. lbs) 10 mm : 300~400 kg-cm (21.7~28.9 ft. lbs)
⑧	Rear brake torque bolt nut.	180~220 kg-cm (13.0~15.9 ft. lbs) (Fig. 6-26, 27)

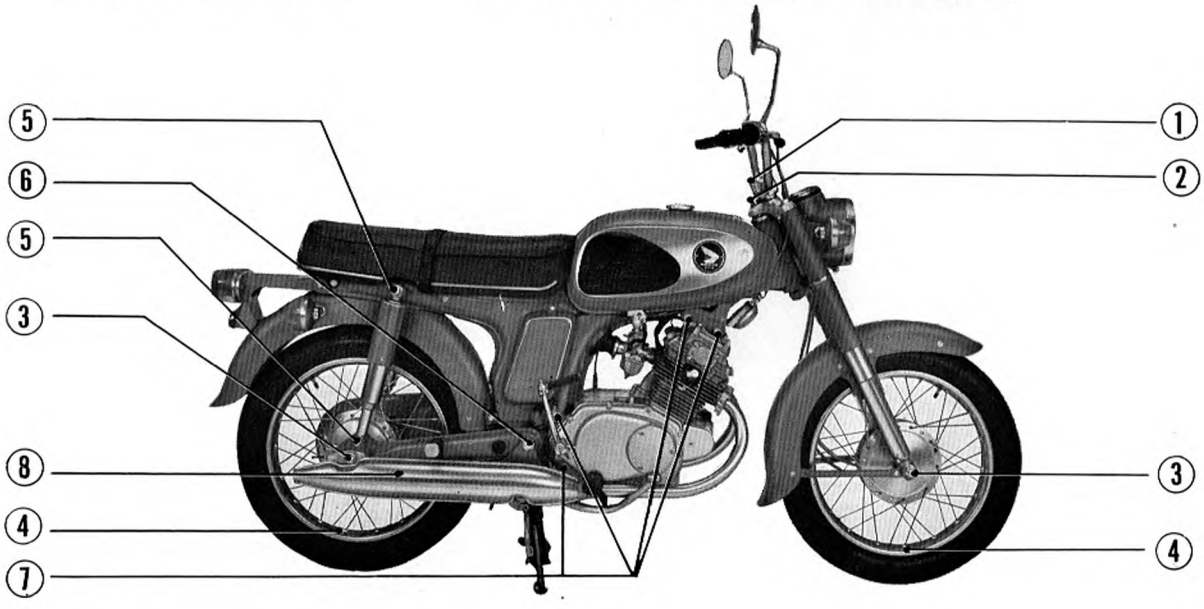
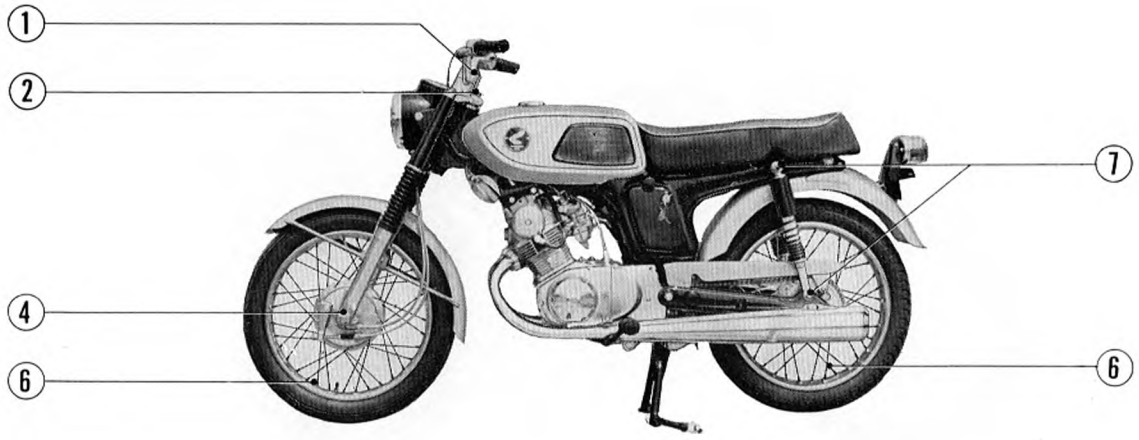
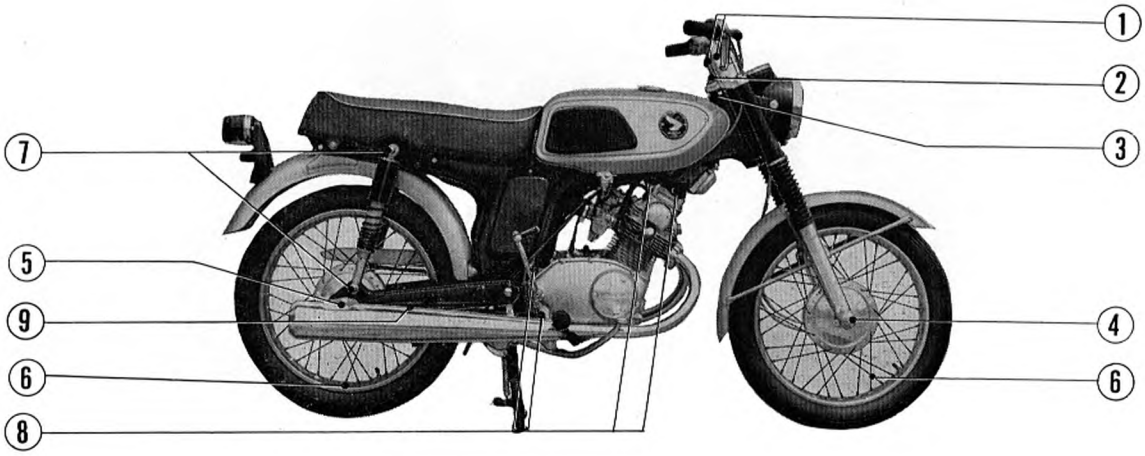
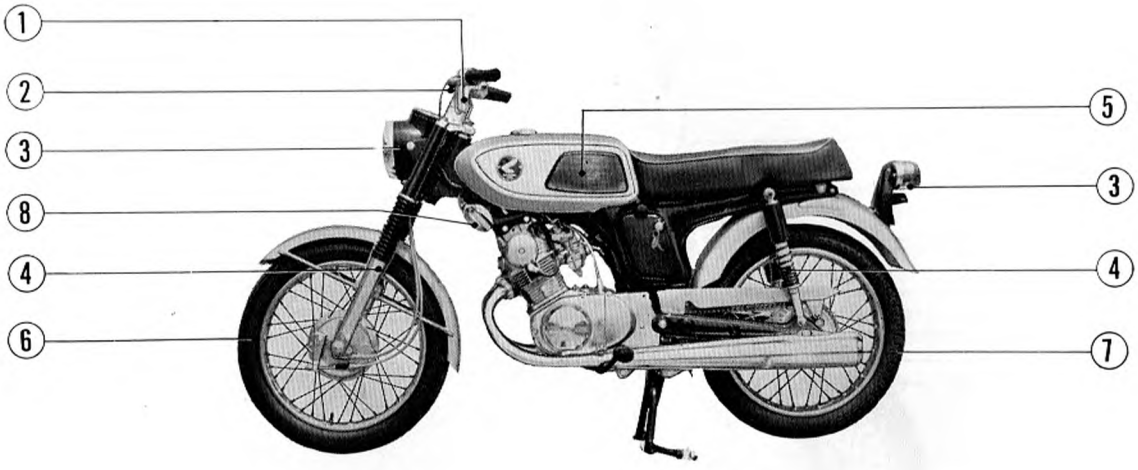


Fig. 6-27

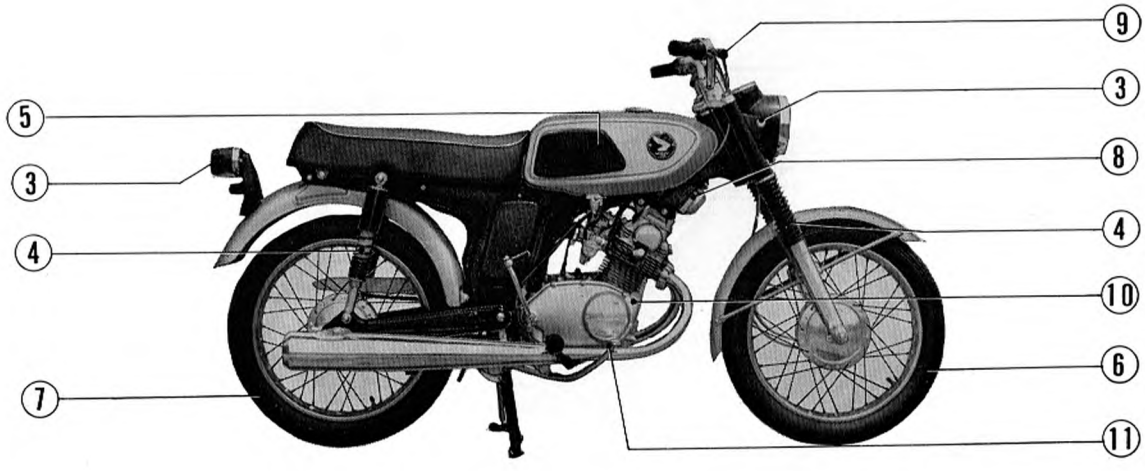


①	Handle installation nut	150～ 250 kg-cm (10.1～18.1 ft. lbs)
②	Steering stem nut	900～1200 kg-cm (72.2～86.8 ft. lbs)
③	Handle top bridge	400～ 500 kg-cm (28.9～36.1 ft. lbs)
④	Front axle nut	700～ 900 kg-cm (50.6～72.3 ft. lbs)
⑤	Rear axle nut	900～1100 kg-cm (72.3～79.5 ft. lbs)
⑥	Wheel spokes	15～ 20 kg-cm (1.0～ 1.5 ft. lbs)
⑦	Rear cushion upper and lower nuts	200～ 350 kg-cm (14.5～25.3 ft. lbs)
⑧	Engine hanger bolts (upper)	200～ 300 kg-cm (14.5～21.7 ft. lbs)
	(lower)	300～ 400 kg-cm (21.7～28.9 ft. lbs)
⑨	Rear brake torque bolt nut	150～ 250 kg-cm (10.1～18.1 ft. lbs)





① Check for excessive looseness or sway of the handle.
② Check for proper free play of the clutch lever.
③ Check the function of the headlight, taillight, stop light and turn signal lights.
④ Check for looseness and oil leaks in the front and rear cushions.
⑤ Check fuel quantity.
CD125A : 10 ℓ (2.6 US. gal, 2.2 Imp. gal)
SS125A : 8.2 ℓ (2.2 US. gal, 1.8 Imp. gal)
CL125A : 9.5 ℓ (2.5 US. gal, 2.1 Imp. gal)
⑥ Front tire air pressure 1.8 kg/cm^2 (25.6 lbs/in^2)
⑦ Rear tire air pressure 2.0 kg/cm^2 (28.5 lbs/in^2)
⑧ Check the horn for sound and loudness.
⑨ Check for proper play of front brake lever.
⑩ Correct level and condition of engine oil.
CD125A/SS125A/CL125A : 1.2 ℓ (2.5 US. pt, 2.1 Imp. pt)
⑪ Check for proper play of the rear brake lever.



6.2 PERIODIC INSPECTION AND SERVICING

A. Daily inspection

It is of utmost importance to perform periodical inspection and servicing so that troubles can be prevented and the motorcycle maintained in the best of operating condition. The inspection is classified into two types, namely, the pre-riding inspection performed by the rider daily and the periodical inspection which is performed at a regular schedule either by the rider or the service shop.

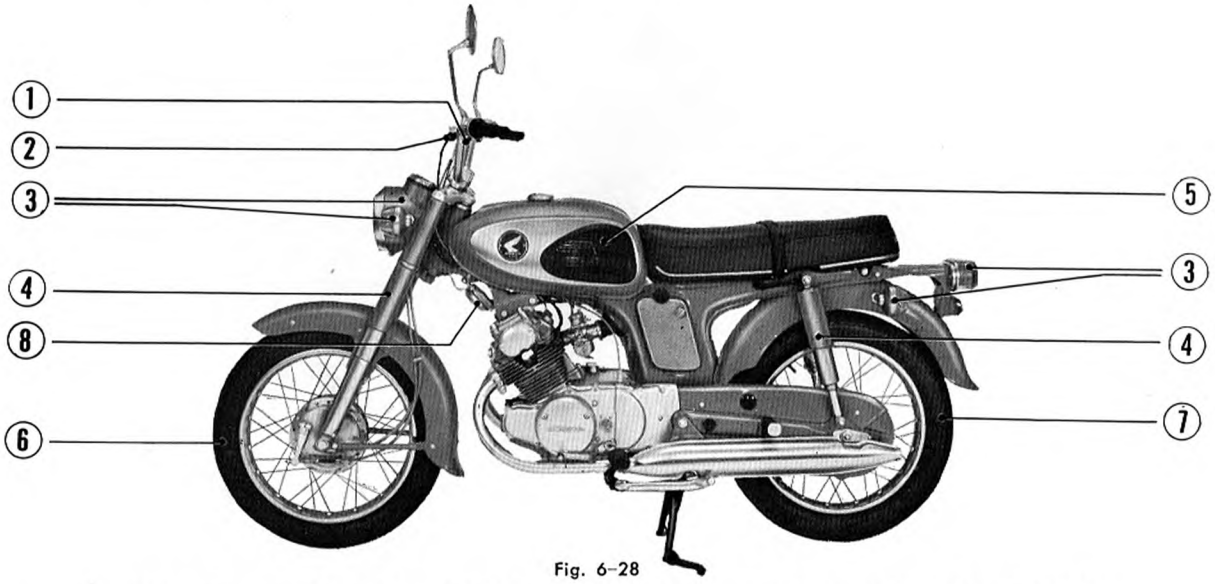


Fig. 6-28

The following items of inspection should be performed daily as a matter of habit. **(Fig. 6-28, 29)**

① Check for excessive looseness or sway of the handle.
② Check for proper free play of the clutch lever.
③ Check the function of the headlight, taillight, stoplight and turn signal lights.
④ Check for looseness and oil leaks in the front and rear cushions.
⑤ Check fuel quantity. CD175 : 10.0 ℓ (2.6 US gal. 2.2 Imp. gal.) CD125A : 9.5 ℓ (2.5 US gal, 2.1 Imp. gal.)
⑥ Front tire air pressure 1.8 kg/cm² (25.6 lbs/in²)
⑦ Rear tire air pressure 2.0 kg/cm² (28.5 lbs/in²)
⑧ Check the horn for sound and loudness.
⑨ Check for proper play of front brake lever.
⑩ Correct level and condition of engine oil
CD175 : 1.5 ℓ (3.2 U.S. pt., 2.7 Imp. pt.)
CD125A : 1.2 ℓ (2.5 U.S. pt., 2.1 Imp. pt.)
⑪ Check for proper play of the rear brake lever.

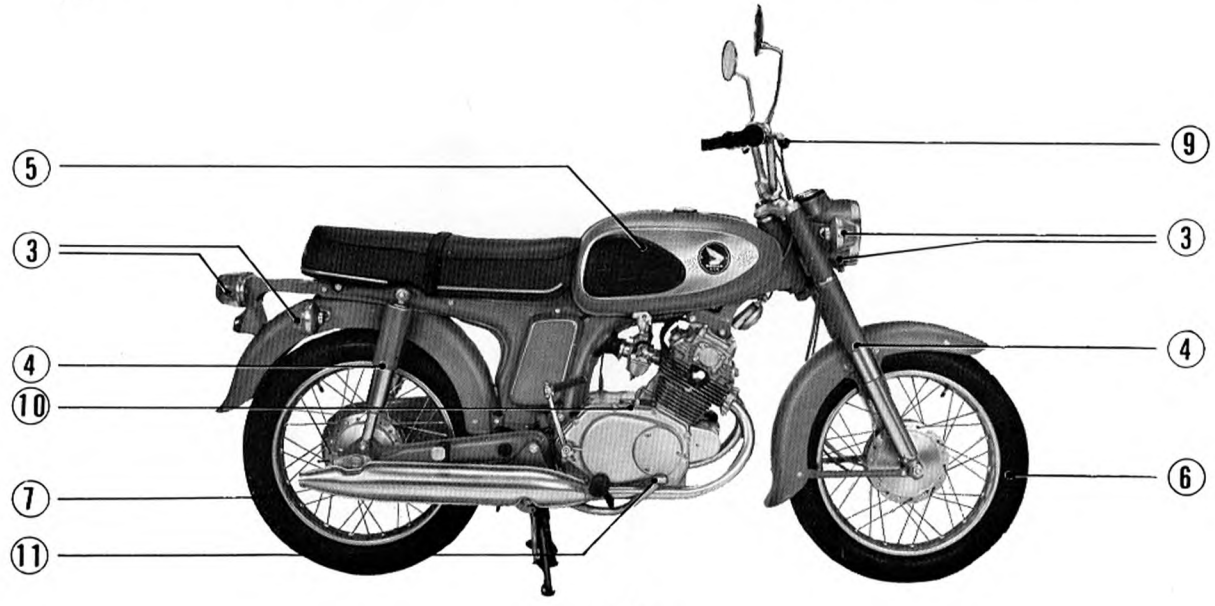


Fig. 6-29

(Note)

After inspecting the above items, attention should be paid to the following points when riding.

1. After starting, warm up the engine for two minutes at low speed.
   When the engine is cold, the viscosity of the oil is heavy and does not permit adequate lubrication to all parts.
2. Do not race the engine needlessly.
3. Refrain from sudden acceleration or braking, tight cornering.
4. Check battery electrolyte level weekly without fail. Under the following conditions, checks should be made at a more frequent intervals.
   a. Riding in mountainous area.
   b. More frequent inspection is necessary when riding at high speed.

Periodic Inspection

Periodic inspection and servicing should be performed in accordance with the following table.

Intervals by speedometer km (miles) / Items	300 (180)	1,000 (620)	2,000 (1,240)	3,000 (1,860)	4,000 (2,480)	5,000 (3,100)	6,000 (3,720)	7,000 (4,340)	8,000 (4,960)	9,000 (5,580)	10,000 (6,200)	11,000 (6,820)	12,000 (7,440)
Change engine oil	●	●	●	●	●	●	●	●	●	●	●	●	●
Adjust ignition timing				●			●			●			●
Adjust valve clearance	●			●			●			●			●
Adjust cam chain	●			●			●			●			●
Adjust clutch		●		●			●			●			●
Adjust carburetor				●			●			●			●
Adjust drive chain	●	●	●	●	●	●	●	●	●	●	●	●	●
Adjust front and rear brake		●	●	●	●	●	●	●	●	●	●	●	●
Clean spark plug				●			●			●			●
Clean oil filter	●						●						●
Clean air cleaner							●						●
Clean fuel strainer				●			●			●			●
Clean muffler							●						●
Check tightness of spokes		●					●						●
Retighten nuts and bolts							●						●
Adjust lighting equipments and horn				●			●			●			●
Check battery	●	●	●	●	●	●	●	●	●	●	●	●	●

MEMO

7. TROUBLE SHOOTING

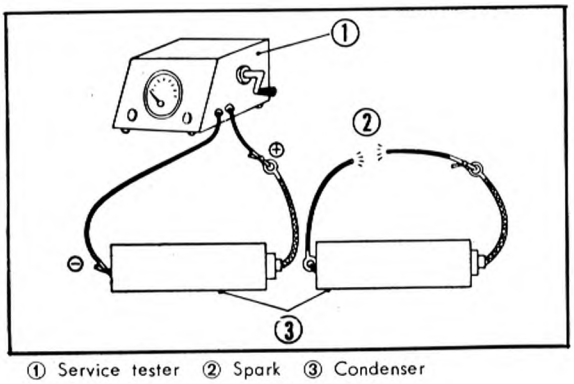
It is most important that the cause of any trouble be located as soon as possible and the proper corrective action taken so that the serviceable life of the engine will be extended.

Listed in the following tables are the troubles, probable causes and the corrective actions.

1. MAIN ENGINE TROUBLE

Troubles	Probable causes	Corrective action
Engine will not continue running.	1. Clogged fuel cock. 2. Plugged vent hole in fuel tank cap. 3. Improper tappet clearance. 4. The carburetor to intake manifold connecting tube damaged or leaking air at the joints. 5. Improper oil level	Clean and inspect, make proper adjustments and replace any damaged parts.
Engine malfunctions after warm-up.	1. Defective spark plug 2. Defective ignition coil 3. Incorrect float level	1. Overheated spark plug, replace with plugs of correct heat range
Excessive smoke at high engine speed. (oil pumping condition)	1. Oil being pumped into the combustion chamber due to excessively worn or damaged cylinder, piston, rings and burned during combustion.	By diagnosing the noise, rebore and/or replace the parts as required.
Noise produced near the top of the engine	1. Worn piston and cylinder. The clearance between the piston and cylinder is increased causing the piston skirt to slap against cylinder wall during combustion. 2. Worn connecting rod large end produces knocking 3. Tappet noise	1. Inspect and rebore cylinder and replace worn parts. 2. Replace connecting rod, large end bearing and crank pin. 3. Adjust to proper specification.
Overheating engine	1. Carbon deposit accumulation 2. Dirty or fouled spark plugs 3. Improper type spark plugs or gap 4. Insufficient lubrication to drive chain or chain tension too tight. 5. Oil level too low, poor or improper grade oil 6. Improper distributor point gap clearance, dirty, burnt 7. Excessive carbon accumulation in combustion chamber	1. Disassemble and clean 2. Clean, dry fouled plugs. Inspect carburetor if plugs continues to foul. 4. Adjust periodically, lubricate 7. Adjust periodically
Engine does not start (lack of compression)	1. Foreign object caught between valve and valve seat 2. Tappet stuck open 3. Ignition timing out of adjustment 4. Blown fuse	1. Disassemble and clean 2. Adjust 3. Adjust 4. Replace with new fuse

Engine suddenly stalls while running	1. Clogged fuel cock 2. Fuel passage in the carburetor clogged 3. Dirty spark plugs (heavy carbon deposit or wet plug) 4. Ignition timing out of adjustment 5. Blown fuse	1. Disconnect the fuel line and check the fuel flow 5. If the fuse is blown, the pilots lamps will not light up
Oil becomes emulsified (especially during winter)	1. Water mixed with oil 2. Use of improper type oil 3. Clogged breather pipe	2. Use Honda Ultra Oil or equivalent oil **(Caution)** The oil, even though clean in appearance, may decomposed due to extended use and become thin, resulting in loss of lubricating properties. Should be replaced.
Increased fuel consumption. (related symptoms) • Low exhaust noise, low back pressure at muffler • Low compression noticeable when kick starting.	1. Clogged air cleaner 2. Distributor point gap out of adjustment, dirty, burnt 3. Excess accumulation of carbon in cylinder exhaust port or inside muffler. 4. Ignition timing retarted 5. Worn cylinder, piston, piston ring.	1. Service air cleaner element 2. Adjust gap clearance, rework or replace burnt points 4. If ignition timing is retarded, the distributor points will open after the timing mark "F" has been passed. Adjust to proper setting
Insufficient engine rpm.	1. Fuel passage clogged 2. Defective spark plug (fouled) 3. Clogged muffler 4. Clogged air cleaner 5. Ignition timing out of adjustment	1. When the fuel passage in clogged, the spark plugs will be dry. 4. If the air cleaner is clogged, engine will not develop high RPM and the exhaust smoke becomes dark. Clean the air filter element periodically.
Poor throttle response (check first to see that the throttle cable is properly adjusted)	1. Clogged air cleaner. 2. Clogged exhaust port or exhaust pipe 3. Ignition timing out of adjustment 4. Tappet clearance out of adjustment	
Distributor points burnt	1. Points covered with oil 2. Improper ignition timing 3. Defective condenser 4. Condenser in poor condition	Test the condenser by method described below.



① Service tester ② Spark ③ Condenser
Fig. 7-1. Measuring condenser capacity

Condenser Test Method

After taking the resistance value with the manager, use a copper wire to short across the terminals, a good strong spark should be produced at the instance the leads are contacted.

Condenser Measurement

With the distributor points open, measure the resistance between the primary terminal and the outer shell, a good condenser should measure at least 5 M Ω resistance at standard temperature.

The condenser is defective if it measures below 1 M Ω

Determine the condition of the condenser by the above-method.

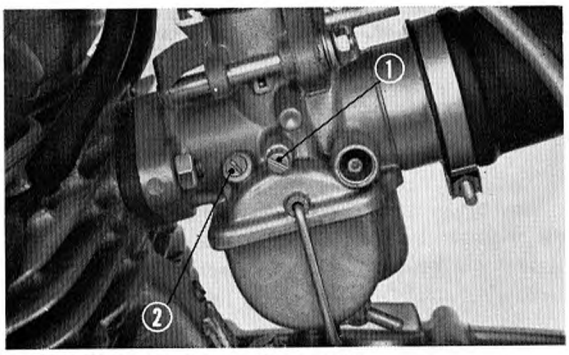
(Caution)

A loosely installed condenser or dirty terminal will cause ignition to malfunction.

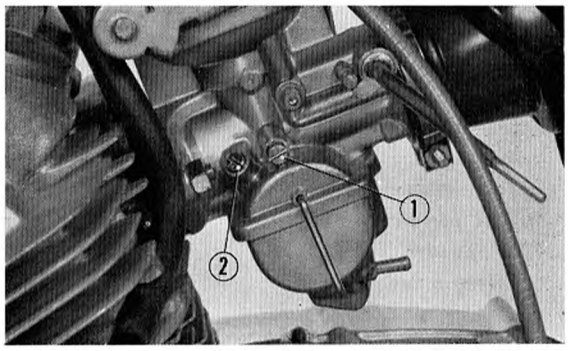
2. CARBURETOR TROUBLE

Trouble	Probable cause	Corrective action
1. Fuel overflow (related symptoms) • Poor idling • Poor performance at all speed • Excessive fuel consumption • Hard starting • Low power output • Poor acceleration	1. Contaminated fuel	1. Remove float chamber cover a. Remove locking clip and disassemble the float chamber b. Check for any dirt lodge in the valve seat, remove dirt by blowing with compressed air or by unscrewing the valve seat, and clean. c. Reassemble after cleaning in gasoline.
	2. Damaged valve or valve seat	2. Replace both the valve and valve seat with new parts.
	3. Punctured float	3. Remove the float chamber cover, take out the float and check for fuel in the float. (Checking procedure) • Shake the float • Immerse the float in hot water 90–95°C (194–263°F) for approximately 60 seconds, bubbles can be observed if the float is punctured.
	4. Float arm lip bent	4. Straighten the arm lip if bent and use the fuel level gauge to obtain the proper fuel level.

Trouble	Probable cause	Corrective action
2. Poor idling (related symptoms) • Poor performance at slow speed • Poor speed transistion • Poor response to throttle snapping • Poor performance at medium speed	1. Air screw improperly adjusted	1. Turn the air screw lightly to full close and check to see if the air screw was properly adjusted. Back off $1\frac{1}{8} \pm \frac{1}{8}$ turn from full close. Start the engine and turn the air screw in both direction not more than $\frac{1}{4}$ turn and set at the point where the engine rpm is highest (smooth).
	2. Throttle stop screw out of adjustment	2. Back off the throttle stop screw all the way and check for proper operation of the throttle, turn the stop screw in until the proper rpm is obtained.
	3. Clogged slow jet (including pilot jet)	3. Unscrew the plug, remove the pilot jet, check for any dirt, blow out with compressed air if dirty. Remove the slow jet and clean in the same manner.



① Throttle stop screw ② Air screw
Fig. 7-2. Adjusting idling (CD175)



① Throttle stop screw ② Air screw
Fig. 7-3. Adjusting idling (CD125A)

Trouble	Probable cause	Corrective action
3. Poor performance at intermediate speed (related symptoms) • Flat spot • Poor acceleration • Excessive fuel consumption • Poor speed transition	1. Clogged slow jet (include pilot jet)	1. Same corrective action as for poor idling
	2. Jet needle at improper setting	2. Adjust to the proper stage (3 stages)
	3. Improper fuel level	3. Replace worn jet needle with new part. Use the fuel level gauge and adjust the level by bending the float arm lip.
	4. Clogged air vent	4. Clean out the air vent

Trouble	Probable cause	Corrective action
4. Poor high speed performance (related symptoms) • Loss of power • Poor acceleration • Black exhaust smoke • Poor engine performance	1. Loose main jet or clogged with dirt 2. Clogged air vent tube 3. Choke closed 4. Fuel cock improperly positioned 5. Loose jet needle	1. Remove main jet and clean, install and tighten securely. 2. Clean out vent tube 3. Open the choke to full OPEN position 4. Position the fuel cock lever to full OPEN position. 5. If jet needle locking clip is broken, replace with a new part.
5. Hard starting	1. Excessive use of choke 2. Fuel overflow 3. Fuel cock in closed position	1. Start engine with choke valve fulley open (to dry wet plug) 2. Same corrective action as 1 above 3. Open fuel cock

3. ENGINE NOTICE

Trouble	Probable cause	Corrective action
1. Tappet noise	1. Excessive tappet clearance 2. Worn tappet	1. Adjust to proper clearance 2. Repair or replace
2. Piston slap	1. Worn piston, cylinder 2. Carbon deposit in combustion chamber 3. Worn piston pin bore, connecting rod small end	1. Repair or replace 2. Remove carbon 3. Repair or replace
3. Cam chain noise	1. Tensioner out of adjustment 2. Stretched chain 3. Worn teeth on cam sprocket, timing sprocket	1. Readjust 2. Replace 3. Replace
4. Clutch knock	1. Worn clutch friction disc outer tab area 2. Worn clutch center spline	1. Repair or replace 2. Repair or replace
5. Crankshaft noise	1. Crankshaft end play 2. Worn crankshaft bearing	1. Repair or replace 2. Repair or replace
6. Engine noise (magneto noise)	1. Chafing between kick arm and oil seal 2. Breaker point noise, defective slipper surface	1. Repair 2. Replace A.C. generator assembly

4. STEERING SYSTEM

Trouble	Probable cause	Corrective action
1. Handle operates heavy	1. Overtorqued steering cone race 2. Damaged steering steel balls 3. Bent steering stem	1. Readjust 2. Replace 3. Repair
2. Front and rear wheels out of alignment	1. Loose bearing in front or rear wheel 2. Bent rim on front or rear wheel 3. Loose spoke 4. Worn rear fork pivot bushing 5. Twisted frame 6. Drive chain adjuster out of adjustment 7. Defective tire	1. Check for wear and replace as required 2. Straighten by loosening or tightening the spokes. 3. Replace if uncorrectable 4. Replace 5. Repair or replace 6. Adjust to proper value 7. Replace
3. Pulls to one side	1. Right and left cushion not balanced, front or rear. 2. Misalignment of front and rear cushions 3. Bent front fork 4. Bent rear fork 5. Bent front axle 6. Loose component in steering system	1. Replace 2. Replace 3. Repair 4. Repair 5. Repair 6. Repair

5. CLUTCH SYSTEM

Trouble	Probable cause	Corrective action
1. Clutch slips	1. Loss of tension in clutch springs 2. Worn or warped clutch plate 3. Worn or warped clutch friction disc	1. Replace 2. Replace 3. Repair or replace
2. Clutch will not disengage	1. Excessively worn clutch friction disc 2. Improper adjustment	1. Repair or replace 2. Adjust to proper specification
3. Clutch out of adjustment (engine stalls)	1. Warped clutch plate or friction disc 2. Uneven tension of clutch spring	1. Repair 2. Measure tension and repair or replace

6. GEAR CHANGE SYSTEM

Trouble	Probable cause	Corrective action
1. Gears will not engage	1. Broken lug on shift drum 2. Broken lug on shift arm 3. Unsmooth movement between shift drum and shift fork 4. Broken shift fork 5. Broken lug on counter shaft second and third gear 6. Broken lug on main shaft second and third gear	1. Replace 2. Replace 3. Repair 4. Replace 5. Replace 6. Replace
2. Gear change pedal not returning	1. Broken shift return spring 2. Gear shift spindle rubbing against case or cover	1. Replace 2. Repair
3. Gear jump out of engagement	1. Worn lug on counter shaft second and third gear 2. Worn lug on main shaft second and third gear 3. Worn or bent shift fork 4. Broken or loss of tension of shift drum stopper spring	1. Repair or replace 2. Repair or replace 3. Replace 4. Replace

7. SUSPENSIONS

Trouble	Probable cause	Corrective action
1. Soft suspension	1. Loss of spring tension 2. Excessive load	1. Replace
2. Hard suspension	1. Ineffective front cushion damper 2. Ineffective rear cushion damper	
3. Suspension noise	1. Cushion case rubbing 2. Interference between cushion case and spring 3. Damaged cushion stopper rubber 4. Insufficient spring damper oil (front and rear)	1. Inspect cushion spring and case 2. Repair 3. Replace 4. Replace

8. BRAKE SYSTEM

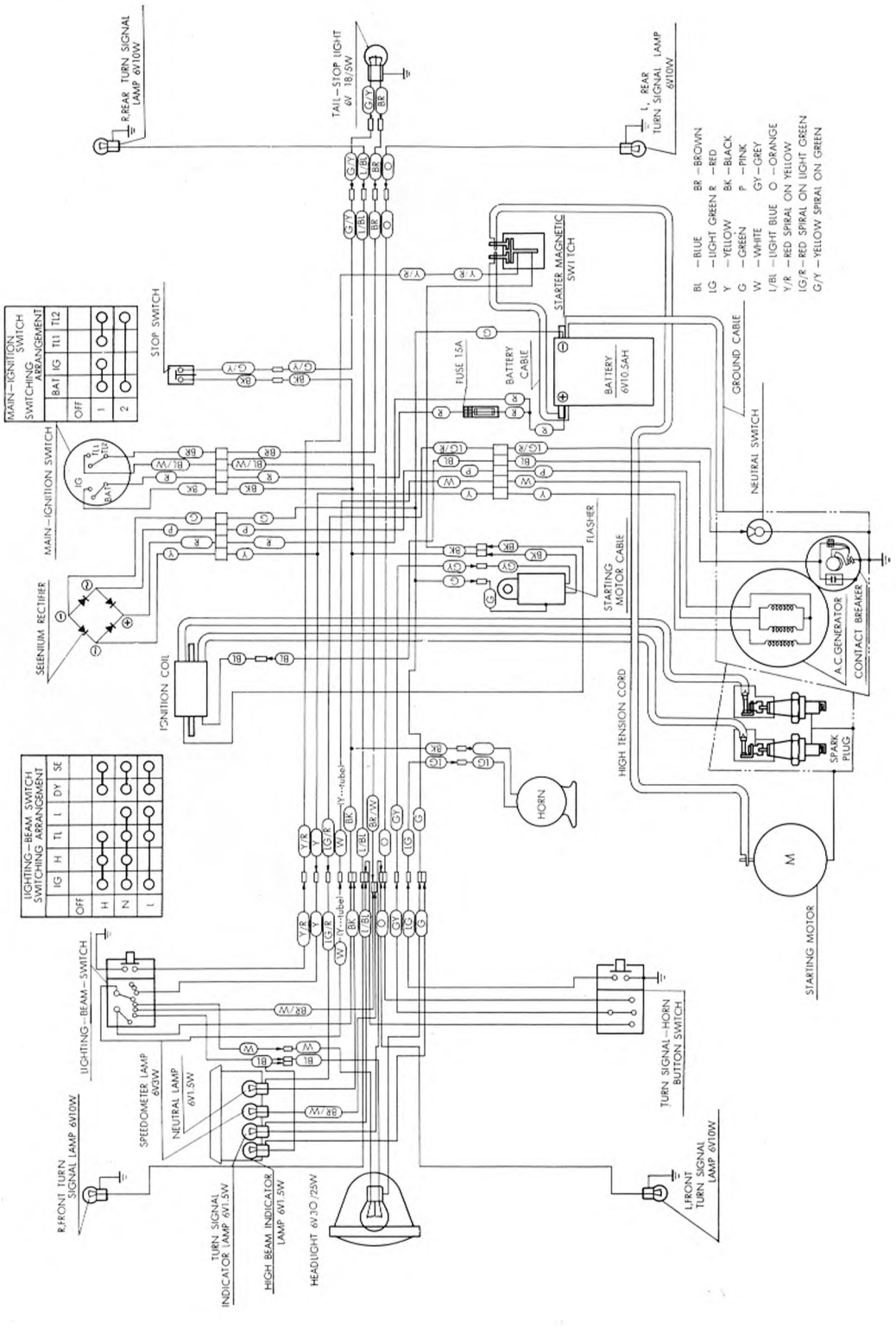
Trouble	Probable cause	Corrective action
1. No range for adjustment	1. Worn brake shoe 2. Worn brake cam slipper 3. Worn brake cam	1. Replace 2. Replace 3. Replace
2. Unusual noise when brake applied	1. Worn brake shoe 2. Foreign object lodged in brake lining 3. Pitted brake drum surface 4. Worn brake panel bushing	1. Replace 2. Remove foreign object 3. Repair 4. Replace
3. Ineffective braking	1. Inoperative front brake cable 2. Loose brake rod 3. Improper shoe contact 4. Dirt or water inside the brake 5. Oil or grease on brake lining	1. Remove foreign object from cable and inspect for bends 2. Inspect and repair 3. Inspect and repair 4. Inspect and repair 5. Inspect and repair

9. DRIVE CHAIN

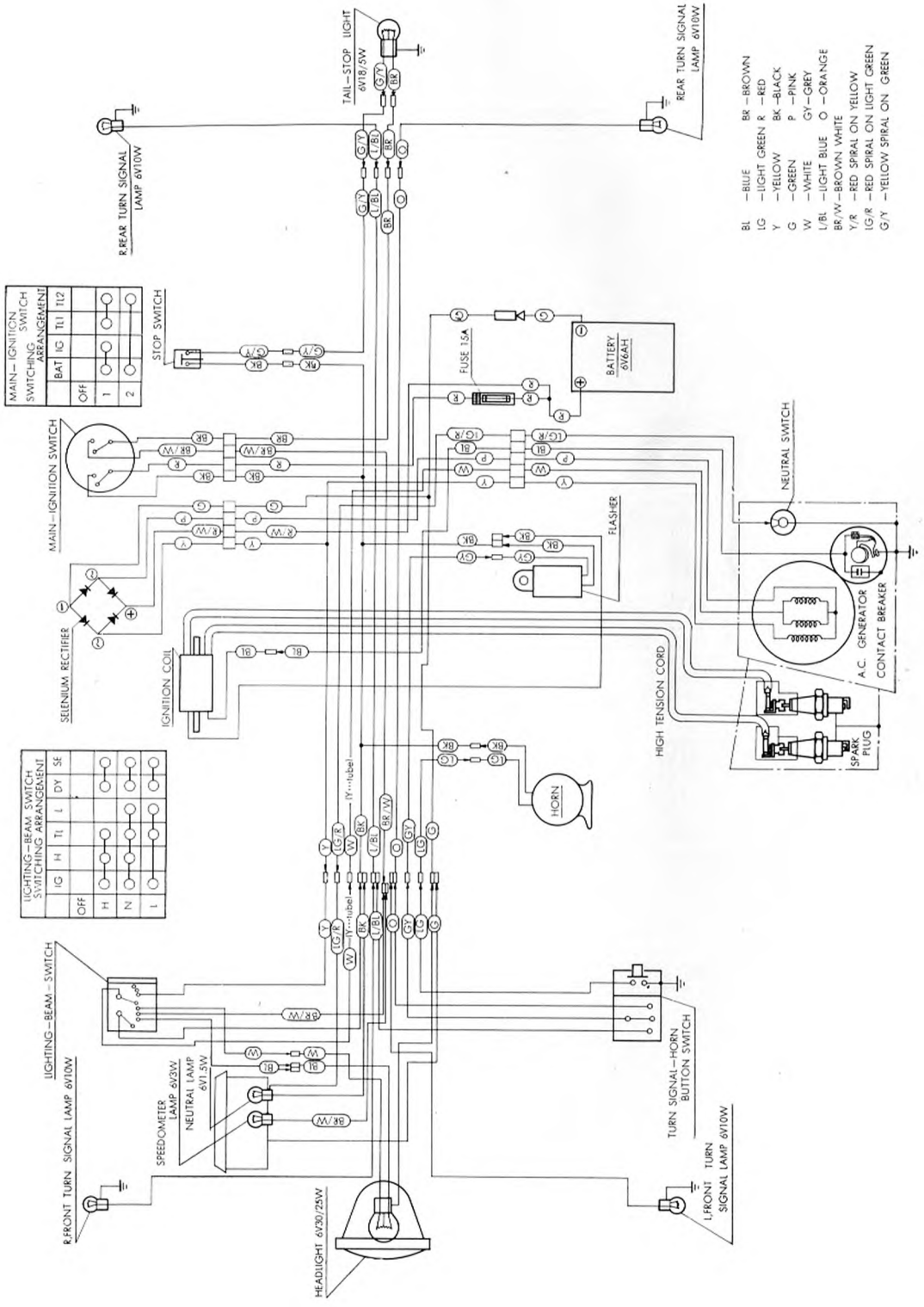
Trouble	Probable cause	Corrective action
1. Excessive stretch to drive chain	1. Excessive load applied to chain (during riding or gear change) 2. Due to oil leak, excessive lubrication periodically	1. Correct riding technique 2. Perform proper lubrication
2. Excessively worn sprocket	1. Driving with worn sprocket 2. Sprocket malfitted to drive chain	1. Clean sprocket area 2. Replace with proper sprocket

8. WIRING DAIAGRAM

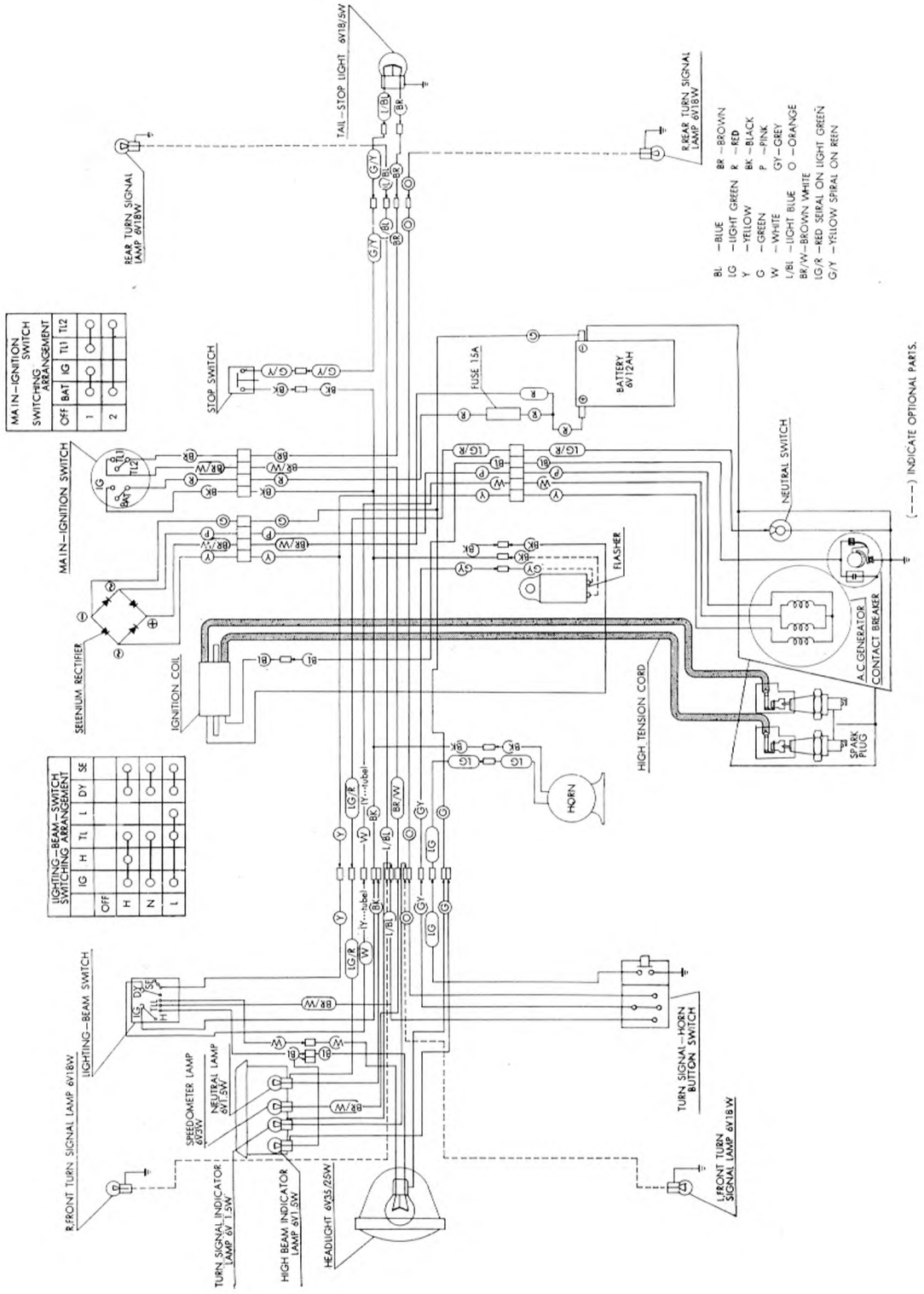
CD125 WIRING DIAGRAM



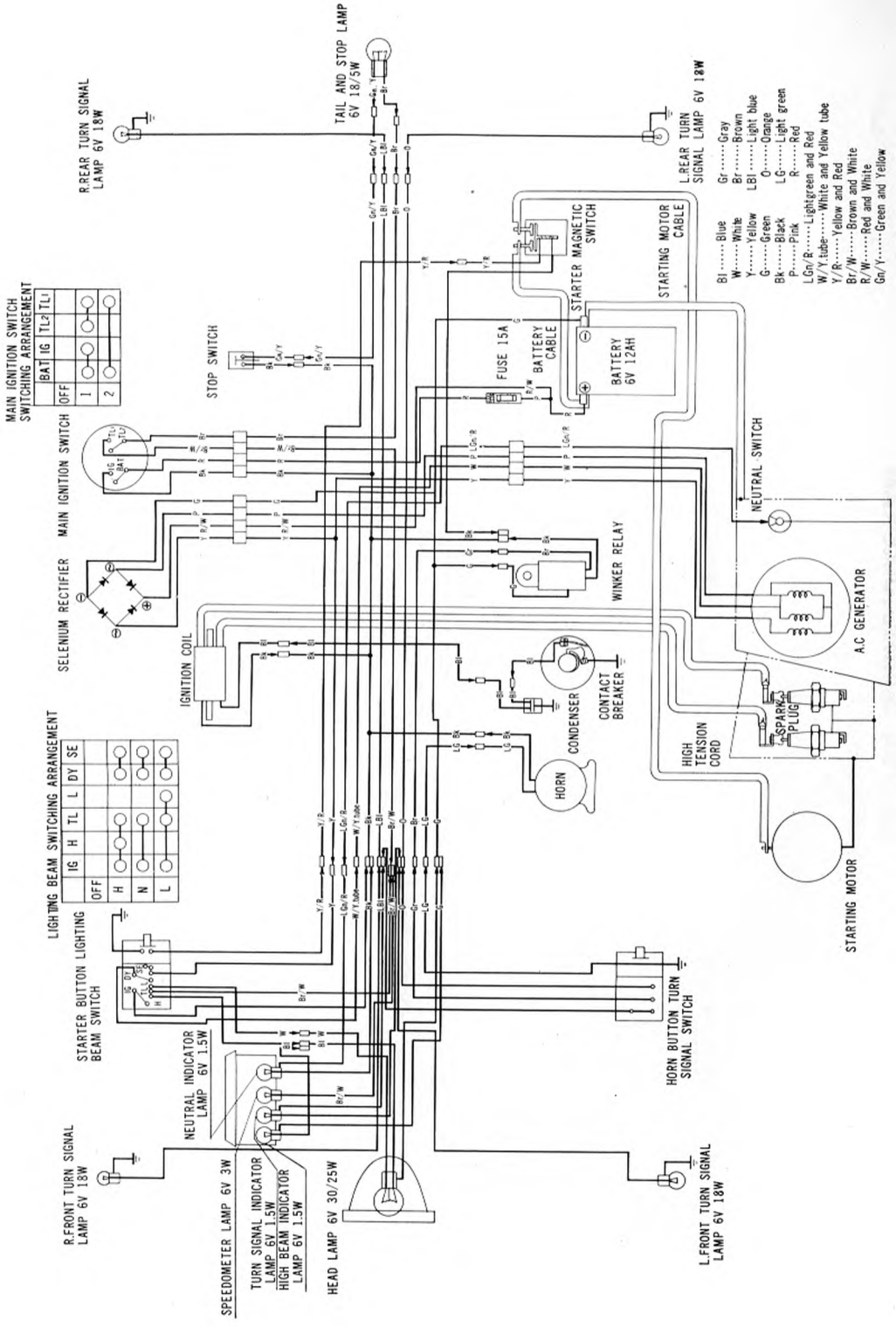
CD125A WIRING DIAGRAM



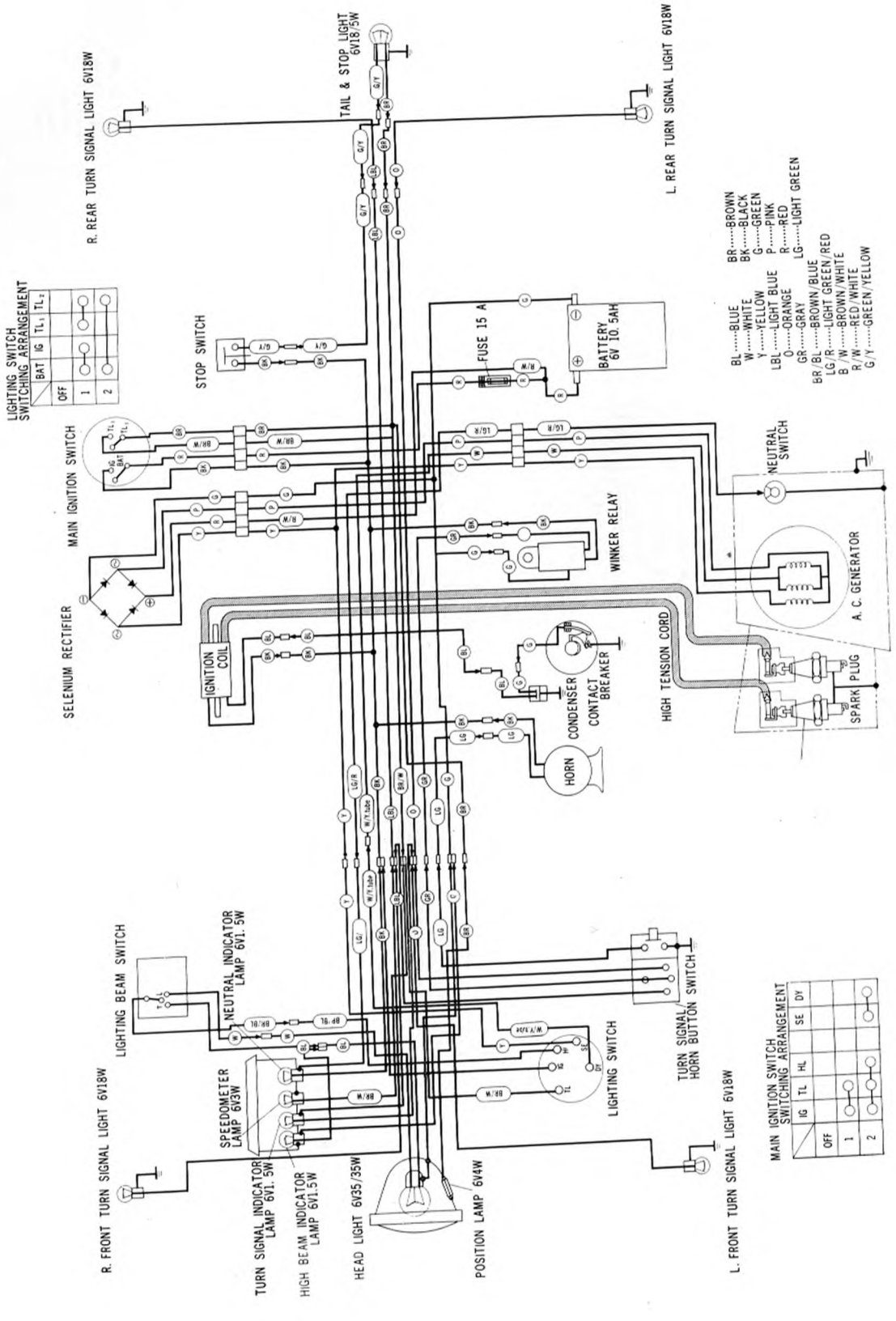
CL/SS125A WIRING DIAGRAM



CD175 WIRING DIAGRAM



CD175A WIRING DIAGRAM



HONDA

HONDA MOTOR CO., LTD. TOKYO, JAPAN

622441

㈱ ⓎA 500802
PRINTED IN JAPAN