

Connecting rod and crankshaft are not available separately. Complete unit can be removed after separating crankcase halves. When reassembling, vary the number and position of shims on ends of crankshaft to provide 0.005 in. end play and center the connecting rod in crankcase. After reassembling, measure the distance from one end of

piston pin bushing in rod to side of cylinder bore in crankcase. Push connecting rod to other extreme of crankpin and measure from other side of piston pin bushing to cylinder bore. Difference of more than 1/64-inch indicates that connecting rod is not centered and must be corrected by changing position of crankshaft shims.

**CLUTCH AND GEAR BOX.** Refer to Figs. N1-5, N1-6 and N1-12 for views of clutch and gear box. Clutch spring adjusting nuts (3—Fig. N1-5 & N1-6) should be tightened until ends of studs are aligned with tops of nuts. If slippage occurs, nuts can be tightened increasing spring tension if all nuts are tightened evenly.

## TRIUMPH

NORTON TRIUMPH CORP.  
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## TIGER CUB

<b>MODEL</b>	<b>T20</b>
Displacement—cc .....	199
Bore—mm .....	63
Stroke—mm .....	64
Ignition—	
Spark plug type .....	Champion L-7
Electrode gap—mm .....	0.5
Inch .....	0.020
Point gap—mm .....	0.35-0.40
Inch .....	0.014-0.016
Valve clearance (cold)	
Intake .....	See Text
Exhaust .....	See text
Electrical system voltage ..	6
Battery terminal grounded ..	Positive
Tire size—front .....	*
Rear .....	**
Rear chain free play—mm ..	19
Inch .....	¾
Number of speeds .....	4

Illustrations courtesy Norton Triumph Corp.

### MAINTENANCE

**SPARK PLUG.** Recommended spark plug for normal use is Champion L-5, KLG F100 or Lodge HN3. A hotter plug such as Champion L-7, KLG F80 or Lodge HN can be used if normal plugs are easily fouled. Electrode gap should be 0.5mm (0.020 inch).

**CARBURETOR.** Amal and Zenith carburetors are used. Refer to the following specification data:

#### Amal 332 (Used on T20 and T20C models)

Refer to Fig. TM1-1

Main jet (13) .....	100
Pilot jet (6) .....	20
Needle jet (11) .....	0.086
Clip (4) in third groove from top of needle (5).	

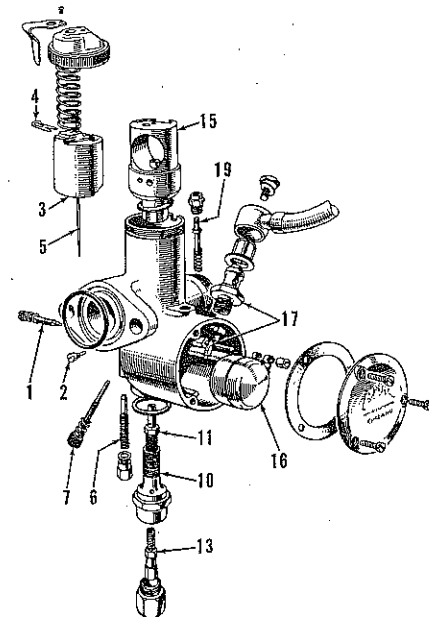


Fig. TM1-1—Exploded view of Amal carburetor typical of that used on T20 and T20C models.

- |                              |                          |
|------------------------------|--------------------------|
| 1. Pilot air adjusting screw | 7. Idle speed stop screw |
| 2. Mixing chamber plug       | 11. Needle jet           |
| 3. Throttle slide            | 13. Main jet             |
| 4. Clip                      | 16. Float                |
| 5. Jet needle                | 17. Float valve          |
| 6. Pilot jet                 | 19. Primer               |

#### Amal 375 (Used on T20 models)

Refer to Fig. TM1-2

Main jet (13) .....	90
Pilot jet (6) .....	25
Needle jet (11) .....	0.106
Clip (4) in third groove from top of needle (5).	

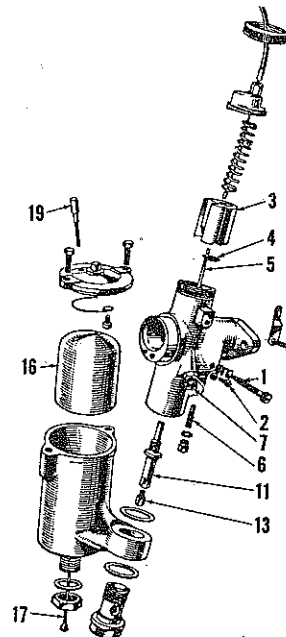


Fig. TM1-2—Exploded view of Amal Monobloc carburetor typical of that used on some models. Refer to Fig. TM1-1 and the following for legend.

- |                |
|----------------|
| 10. Jet holder |
| 15. Jet block  |

#### Amal 376 (Used on T20M models)

Refer to Fig. TM1-2

Main jet (13) .....	140
Pilot jet (6) .....	20
Needle jet (11) .....	0.105T
Clip (4) in second groove from top of needle (5).	

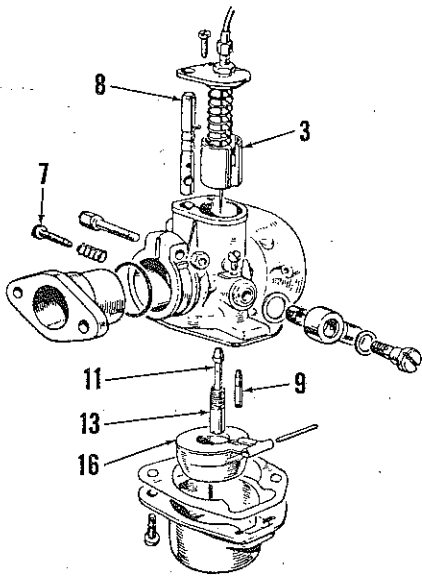


Fig. TM1-3—Exploded view of Zenith carburetor used on some models.

- 3. Throttle slide
- 7. Idle speed stop screw
- 8. Starting valve
- 9. Idle jet
- 11. Atomizer
- 13. Main jet
- 16. Float

**Amal 376 (Used on T20S/H models)**

Refer to Fig. TM1-2

- Main jet (13) ..... 140
- Pilot jet (6) ..... 15
- Needle jet (11) ..... 0.105
- Clip (4) in third groove from top of needle (5).

**Zenith 17MX (Used on some T20 and T20C models)**

Refer to Fig. TM1-3

- Main jet (13) ..... 78
- Idle jet (9) ..... 50
- Starter jet (8) ..... 200/65

**Zenith 18MX (Used on some T20 and T20T models)**

Refer to Fig. TM1-3

- Main jet (13) ..... 84
- Idle jet (9) ..... 45
- Starter jet (8) ..... 200/65

Idle speed is controlled by stop screw (7—Fig. TM1-1, TM1-2 or TM1-3). Idle mixture is adjustable on Amal carburetors by turning the pilot air screw (6—Fig. TM1-1 or TM1-2). Normal setting for idle mixture screw (6) is 2½ turns open.

**IGNITION AND ELECTRICAL.**

Ignition breaker point gap at maximum opening should be 0.014-0.016 inch for all models. Refer to the appropriate following paragraph for ignition timing.

On early models, the ignition timer is driven by the oil pump drive shaft and protrudes up from the right side of engine as shown in Fig. TM1-5. Ignition timing is varied by rotating the timer housing after loosening the clamp screw (S—Fig. TM1-5). On T20S

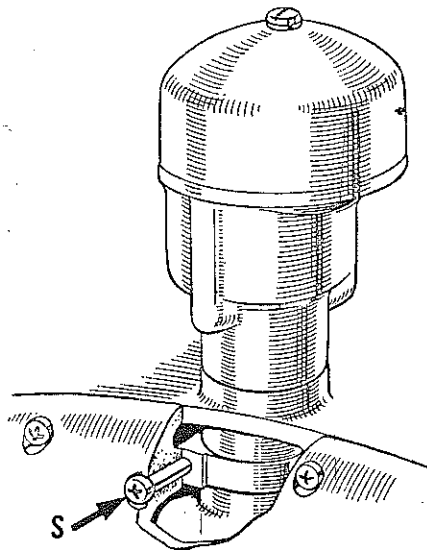


Fig. TM1-5—On early models, ignition timing can be changed after loosening the clamp screw at arrow.

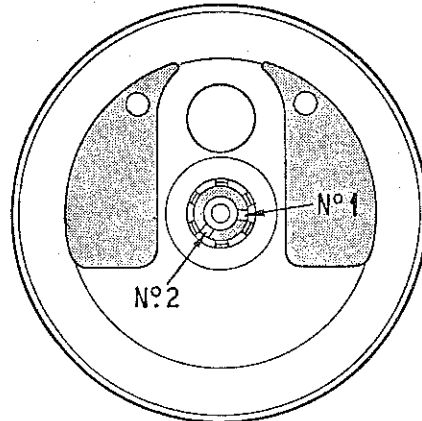


Fig. TM1-6—The alternator rotor should be installed using the No. 1 keyway on all models except T20T trials.

and T20T models with energy transfer ignition accurate breaker point gap, and ignition timing is of utmost importance. The alternator rotor must also be correctly timed to the crankshaft keyway: Refer to Fig. TM1-6. Keyway No. 1 should be used for T20S with timing at 16 degrees BTDC. Keyway No. 2 should be used for T20T models with ignition timing at 8 degrees BTDC. Refer to the following static (engine not running) ignition timing specification data for models with ignition timer driven by the oil pump drive gear:

Model	Piston Crankshaft Position	
	Degrees BTDC	BTDC
T20 (Before Serial No. 17388) .....	8	0.016 inch
T20 (After Serial No. 17387) .....	4	almost TDC
T20C .....	4	almost TDC
T20T .....	8	0.016 inch
T20S .....	16	0.060 inch

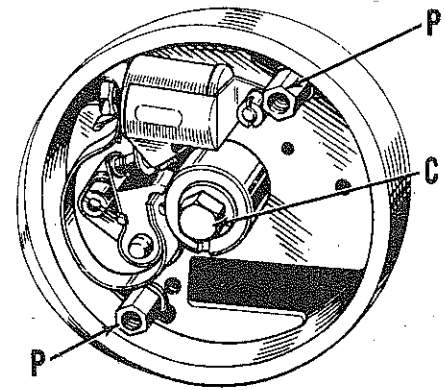


Fig. TM1-7—The ignition cam is located at right end of the engine camshaft on later models. Refer to text for adjustment. Make certain that center screw (C) is tight.

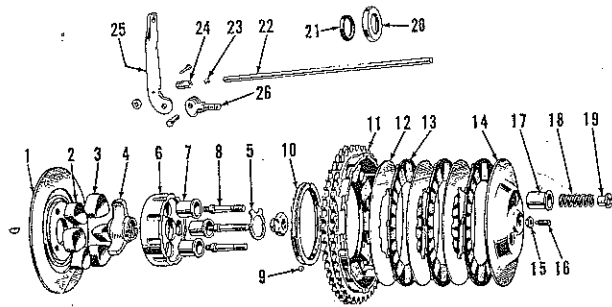
On later models, the ignition cam and advance weights are attached to the right end of the engine camshaft. Refer to Fig. TM1-7. Ignition timing is normally adjusted by moving the ignition stator plate after loosening the pillar screws (P). Some models are equipped with a pin in the end of camshaft and a slot in the ignition cam and advance weights assembly to correctly time the cam during installation. On models without the locating pin, it is necessary to correctly set the ignition timing by relocating the ignition cam assembly on the tapered end of the engine camshaft. Small adjustments can be accomplished by moving the stator plate. Refer to the following static (engine not running) ignition timing specification data for models with ignition timer at the right end of the engine camshaft:

Model	Piston Crankshaft Position	
	Degrees BTDC	BTDC
T20 .....	8	0.16 inch
T20S/H .....	16	0.060 inch
T20M .....	26	0.16 inch

The alternator rotor (magnet) must also be correctly timed to the crankshaft. Keyway No. 1 (shown in Fig. TM1-6) should be used for all models except T20T trials.

**VALVE SYSTEM.** Inlet and exhaust valves are actuated by a camshaft located in right side of crankcase, via cam followers, push rods and rocker arms. Clearance between rocker arm and adjusting screw should be 0.010 in. (0.25mm) for all except models with sports type camshaft. Sports camshafts should have 0.002 in. (0.05mm) clearance for inlet valve; exhaust valve should have 0.004 in. (0.10mm) clearance. All models should be adjusted with engine cold and piston at exact TDC of compression stroke.

# Triumph Cub



- |                             |                              |                           |
|-----------------------------|------------------------------|---------------------------|
| 1. Backing plate            | 10. Sprocket bearing cup     | 18. Clutch springs        |
| 2. Rebound cushions (small) | 11. Sprocket and clutch drum | 19. Spring adjusting nuts |
| 3. Drive cushions (large)   | 12. Steel plates             | 20. Oil seal retainer     |
| 4. Spider                   | 13. Friction discs           | 21. Oil seal              |
| 5. Lock washer              | 14. Pressure plate           | 22. Clutch release rod    |
| 6. Hub                      | 15. Lock nut                 | 23. Ball (5/32-in.)       |
| 7. Driving cups             | 16. Adjusting screw          | 24. Release cup           |
| 8. Spring screws            | 17. Spring cups              | 25. Release lever         |
| 9. Ball bearings            |                              | 26. Lever pivot           |

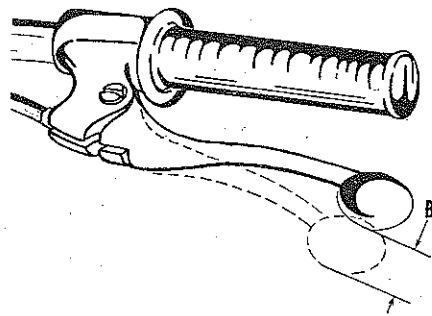


Fig. TM1-11—The clutch hand lever should have 1/16-in. play at B.

**LUBRICATION.** The engine uses a dry sump lubrication system. SAE 40 engine oil should be used above 90 degrees F., SAE 30 from 32 degrees to 90 degrees F. and SAE 20 below 32 degrees F. Engine oil should be drained and filled with new oil every 1500 miles.

The gear box contains 1/2-pint of SAE 30 oil and should be drained and refilled every 6000 miles. The primary chain case should be drained and refilled every 1000 miles with SAE 20W oil.

**CLUTCH.** The clutch, located on the left end of the transmission input shaft, is of the multiple disc wet type. Adjustment is accomplished as follows. Disconnect the cable from the hand lever, loosen locknut (15—Fig. TM1-10) and turn screw (16) in until resistance is felt (clutch lever on engine right side contacts side cover). Back screw (16) out 1/2-turn and tighten locknut. Attach cable and turn cable adjuster to provide 1/16-in. (1.5mm) free play at hand lever (B—Fig. TM1-11).

**SUSPENSION.** The front suspension used on T20 and T20C models is shown in Fig. TM1-14. Capacity of each unit is 75cc (1/2-pint). Unit is drained at stud (41) and refilled at plug (11). Oil should be drained and reserviced with SAW 30 oil every 5000 miles. Tube (10)

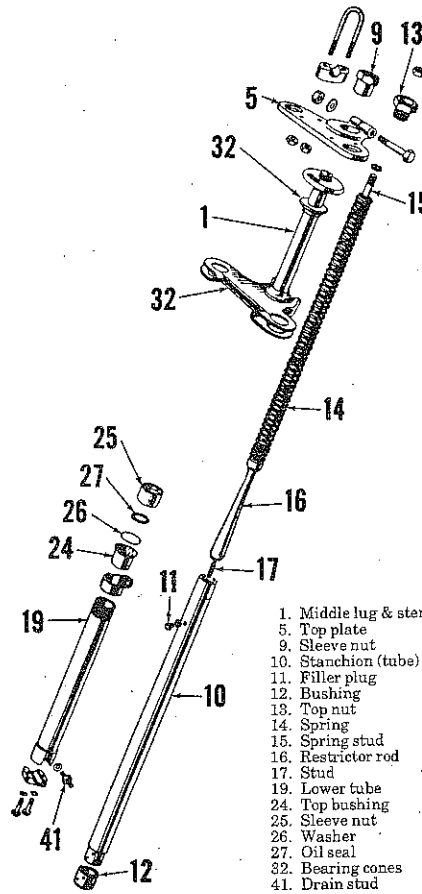


Fig. TM1-14—Exploded view of front suspension used on T20 and T20C models. Stem (1) rides on 1/4-in. diameter bearings. Fifteen are used in each race.

should be renewed, not straightened, if bent more than a total of 15/16 inch. Holes in bushing (12) should be aligned with holes in tube (10). Bearing is removed after drilling holes out with 5/32-in. (4mm) drill. Bushing (12) is locked in place by counter-sinking bushing around holes with a center punch. Springs (14) should be renewed if free length is less than 16 3/4 inches.

# MOTORCYCLE

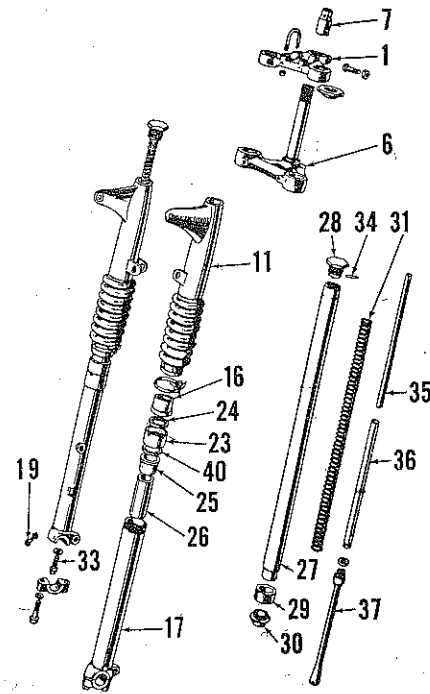


Fig. TM1-15—Exploded view of T20S and T20T front suspension unit. Stem (6) rides on 1/4 in. diameter bearings. Fifteen are used in each race.

- |                        |                      |
|------------------------|----------------------|
| 1. Top plate           | 27. Stanchion (tube) |
| 6. Stem and middle lug | 28. Cap nut          |
| 7. Sleeve nut          | 29. Bottom bushing   |
| 11. Top cover          | 30. Stop nut         |
| 16. Dust cover         | 31. Spring           |
| 17. Bottom tube        | 33. Restrictor bolt  |
| 19. Drain plug         | 34. Pin              |
| 23. Sleeve nut         | 35. Guide tube       |
| 24. Oil seal           | 36. Guide tube       |
| 25. Top bushing        | 37. Restrictor       |
| 26. Damping sleeve     | 40. Washer           |

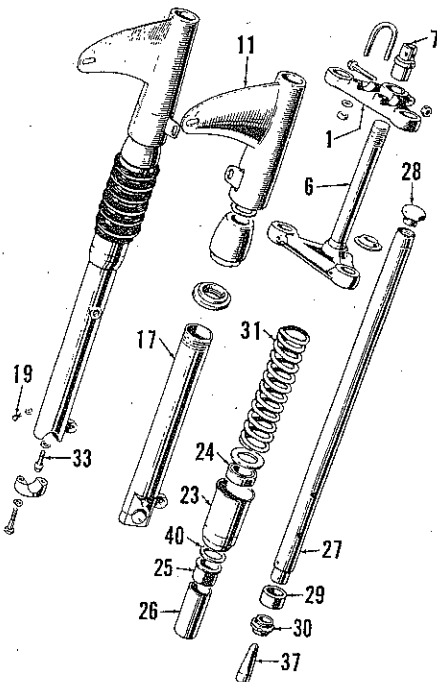


Fig. TM1-16—Exploded view of T20M and T20S/H front suspension unit. Refer to Fig. TM1-15—for legend.

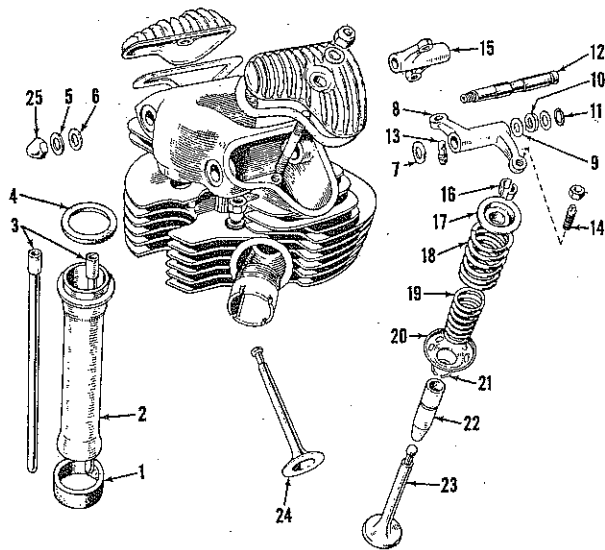


Fig. TM1-18—Exploded view of the cylinder head. Inlet and exhaust valve springs are interchangeable.

1. Push rod tube lower seal
2. Push rod tube
3. Push rods
4. Push rod tube upper seal
5. Copper washer (5/16-inch)
6. Copper washer (3/8-inch)
7. Thrust washer (3/8-inch)
8. Exhaust rocker arm
9. Thrust washer (7/16-inch)
10. Spring washer
11. "O" ring seal
12. Rocker arm shaft
13. Rocker arm pin
14. Adjusting screw
15. Inlet rocker arm
16. Valve keepers
17. Spring retainer
18. Outer spring
19. Inner spring
20. Spring seat
21. Snap ring
22. Valve guide
23. Exhaust valve
24. Inlet valve

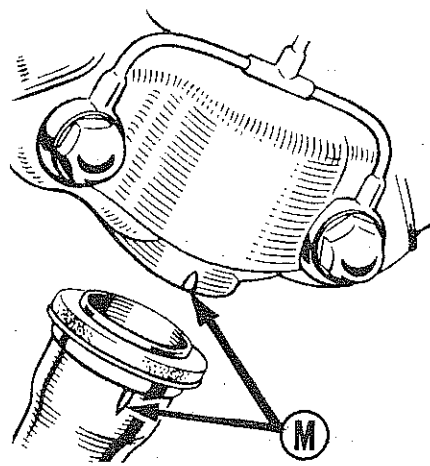


Fig. TM1-20—When installing the push rod tube, align marks (M).

The front suspension used on T20S and T20T models is shown in Fig. TM1-15. Capacity of each unit is 150cc (3/4-pint). Unit is drained at plug (19) and refilled at cap nut (28). Oil should be drained and serviced with same grade of oil as used in engine at least every 5000 miles. Tube (27) should be renewed, not straightened, if bent more than a total of 3/16-inch. Springs (31)

should be renewed if free length is less than 17 3/4 inches.

The front suspension used on T20M and T20S/H is shown in Fig. TM1-16. Capacity of each unit is 200cc (1/2-pint). Unit is drained at plug (19) and refilled at cap nut (28). Oil should be drained and service with same grade of oil as used in engine every 6000 miles.

shafts (12) out toward left. NOTE: Use caution to prevent damage to threads on end of shafts.

When assembling, make certain that rocker arm washers are assembled as shown in Fig. TM1-18. The outside (right) cam follower is for the inlet (rear) rocker arm as shown in Fig. TM1-19. When installing the push rod tube and cylinder head, marks (M—Fig. TM1-20) should be aligned.

REPAIRS

CYLINDER HEAD AND VALVES.

The cylinder head can be removed without removing engine from the frame. The rocker arms are removed after removing nuts (25—Fig. TM1-18) and carefully bumping rocker arm

PISTON, RINGS AND CYLINDER.

The cylinder can be withdrawn from the four studs after removing the cylinder head. Cylinder bore taper or out of round should not exceed 0.005 inch. Piston ring end gap when checked at bottom of cylinder

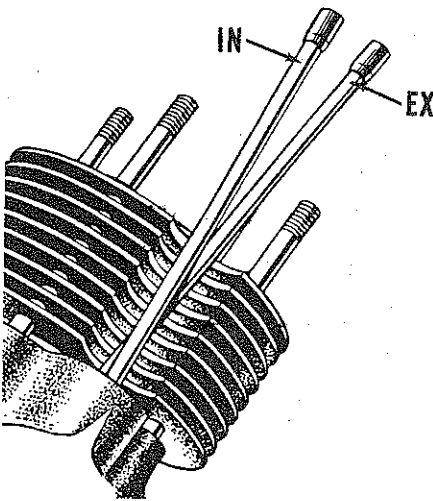


Fig. TM1-19—The inlet cam follower is on outside, exhaust on inside as shown.

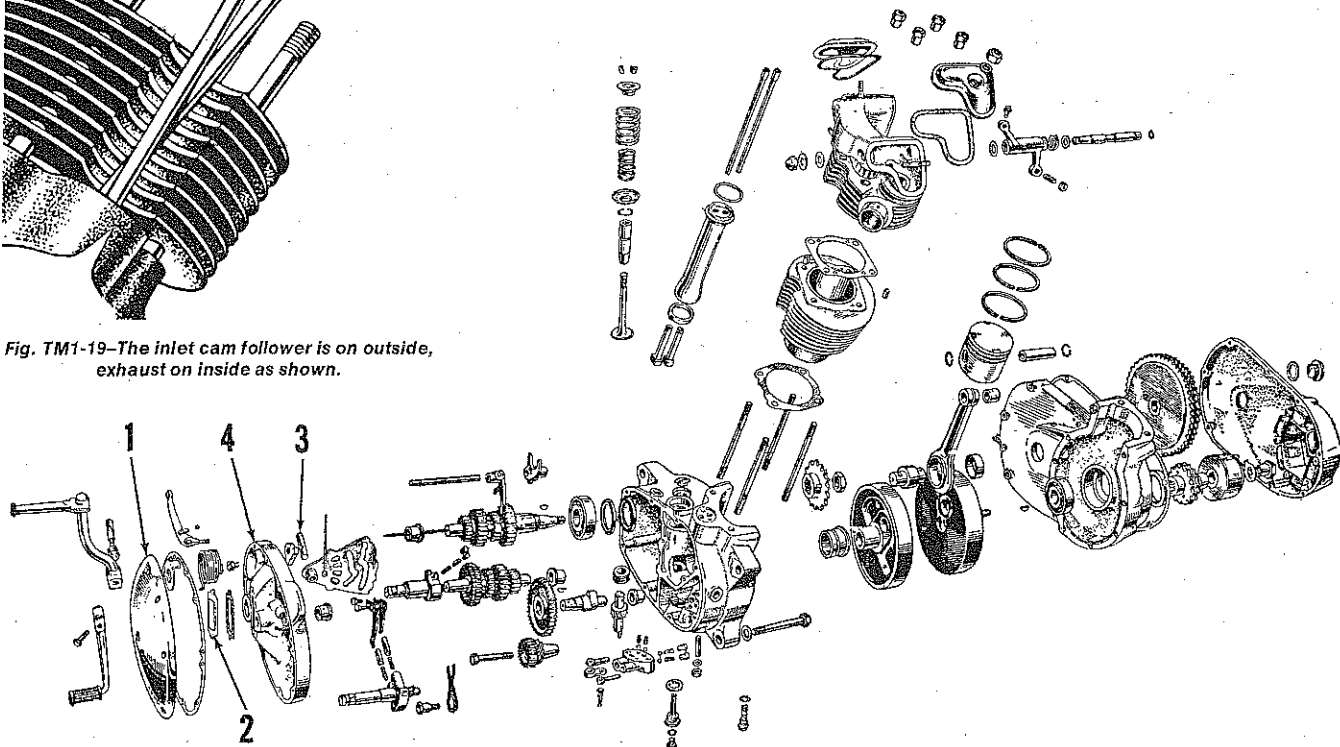


Fig. TM1-22—Exploded view of the engine assembly used on early models. Late models are similar.

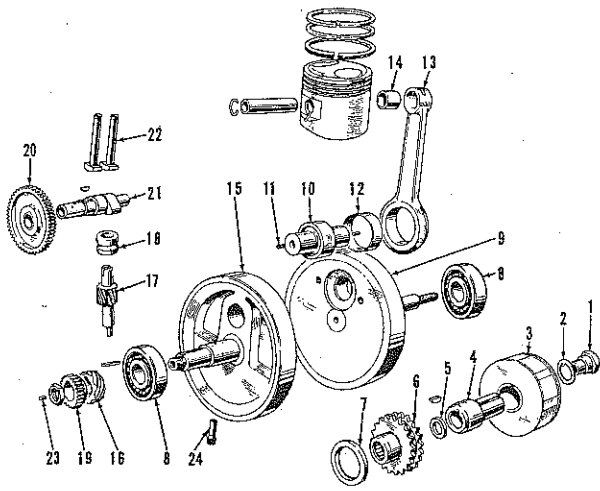


Fig. TM1-23—Exploded view of the late type crankshaft and associated parts.

1. Nut
2. Tab washer
3. Rotor
4. Adaptor sleeve
5. Spacer
6. Primary drive sprocket
7. Oil seal
8. Main bearings
9. Crankshaft left side
10. Crankpin
11. Oil passage plugs (2 used)
12. Bushing
13. Connecting rod
14. Piston pin bushing
15. Crankshaft right side
16. Oil pump drive worm
17. Oil pump drive gear
18. Bushing
19. Crankshaft timing gear
20. Camshaft gear
21. Camshaft
22. Cam followers
23. Oil passage plug

should be within limits of 0.008-0.010 inch.

Make certain that cylinder base gasket is correctly installed with oil return openings aligned with passages in cylinder and crankcase. Refer to the preceding CYLINDER HEAD section for installing the push rods and push rod tube.

**CRANKSHAFT, CONNECTING ROD AND CAMSHAFT.** To remove

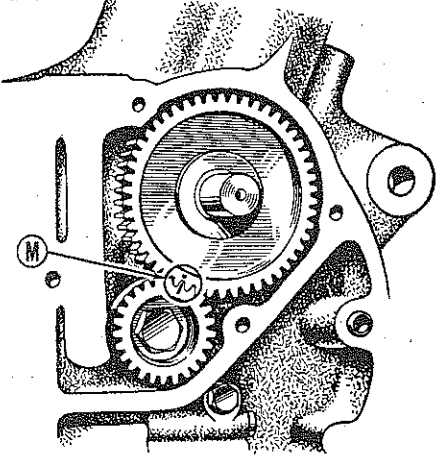
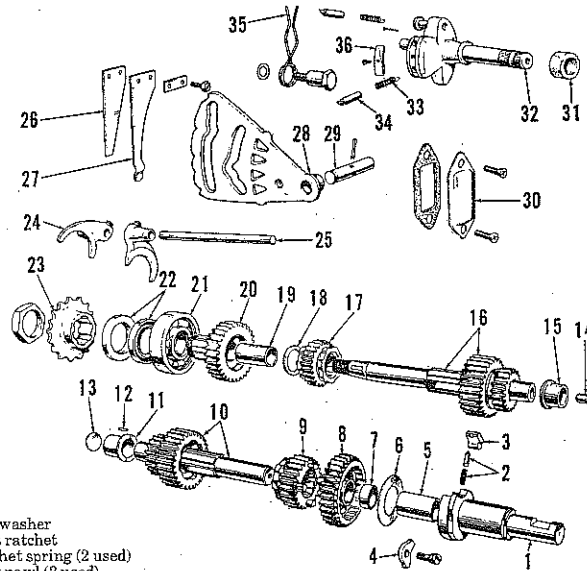


Fig. TM1-24—The timing marks (M) on camshaft gear and crankshaft gear should be aligned as shown.

the crankshaft and connecting rod, it is necessary to separate the crankcase halves. Connecting rod and crankpin are removed by pressing crankshaft apart. Refer to Fig. TM1-23. The crankshaft should be disassembled **ONLY** if required tools are available to check and align the reassembled crankshaft.

Fig. TM1-25—Exploded view of late type transmission. Refer to Fig. TM1-22 for early type.

1. Kick starter shaft
2. Spring and plunger
3. Kick starter pawl
4. Stop plate
5. Bushing
6. Pawl retaining disc
7. Bushing for gear (8)
8. First gear
9. Sliding gear (3rd)
10. Countershaft (layshaft) with 2nd and 4th gears
11. Bushing
12. Bushing pin
13. Plug
14. Clutch rod bushing
15. Bushing
16. Input shaft with 1st and 3rd gears
17. Sliding gear (2nd)
18. Thrust washer
19. Bushing for shaft (20)
20. Output shaft and 4th gear
21. Bearing
22. Oil seals
23. Output sprocket
24. Shift fork
25. Shift rail
26. Spring
27. Detent spring
28. Shift cam
29. Shaft
30. Cover
31. Felt washer
32. Shift ratchet
33. Ratchet spring (2 used)
34. Shift pawl (2 used)
35. Return spring
36. Pawl retainer.



To remove the camshaft, remove the ignition breaker point stator plate, ignition cam assembly and the right side outer cover, then remove the kick starter spring retainer and return spring. Remove the small plate (2—Fig. TM1-22) and withdraw shaft (3). Remove the attaching screws and withdraw the inner cover (4).

When installing the camshaft, timing marks should be aligned as shown in Fig. TM1-24.

**GEAR BOX.** The transmission gears and shafts can be disassembled after the engine is removed and the generator rotor, crankshaft primary drive sprocket, clutch assembly and primary drive chain are removed. Remove the ignition breaker point base plate, ignition cam assembly and the right side outer cover. Remove the kick starter spring retainer and spring. Remove the small plate (2—Fig. TM1-22) and withdraw shaft (3). The inner cover (4) can then be removed. Refer to Fig. TM1-25 for exploded view of transmission gears and shafts.