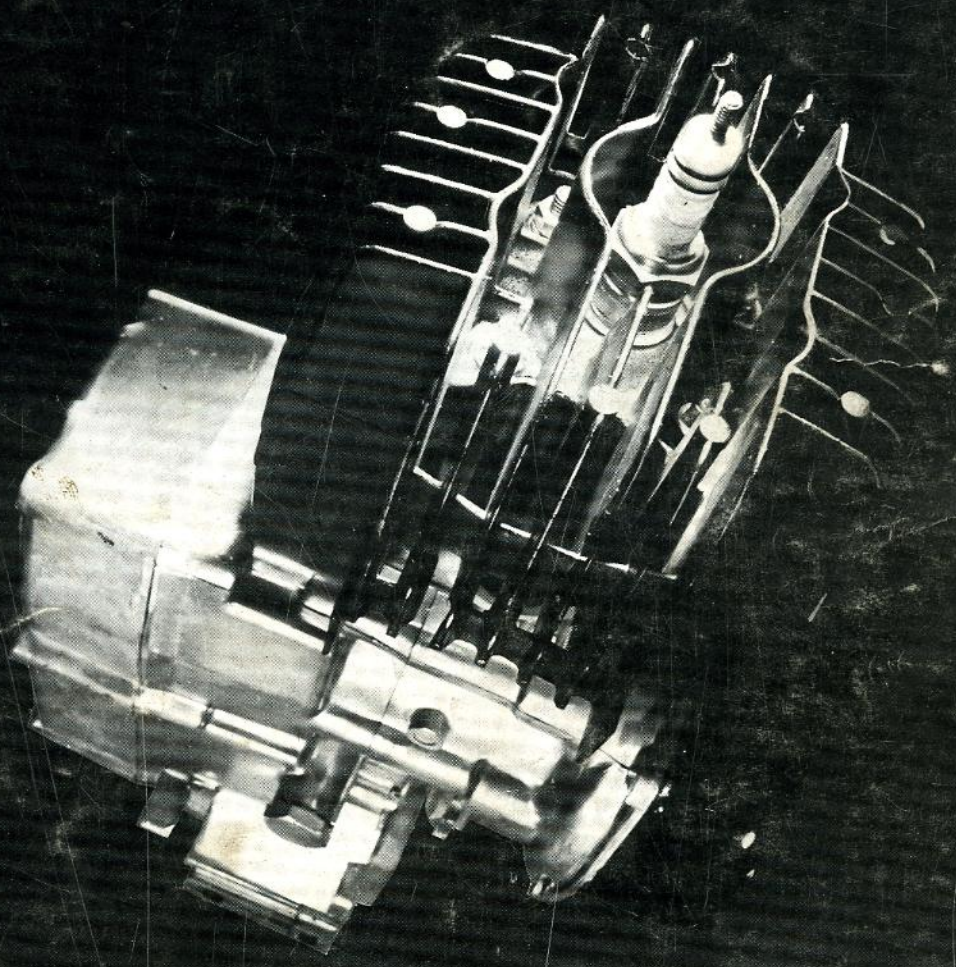
Service Manual

Steyr Daimler Puch of America Corporation Greenwich·Conn. 06830

'80/'81 MODELS



PUCH SERVICE

PUCH

FOREWORD

This service manual for the full range of 1980/81 models was issued to serve our workshops and their staff as guide for expert repairs.
Since the manual is intended as aid for the workshop, we renounced explanations which are self-evident to an expert.
Correct servicing requires the proper equipment including all special workshop tools as detailed in our list of special tools. The workshop manual is the base for appropriate and economical repairs however, it is of full value only combined with the "Service Bulletins" by which any alterations and improvements are publicized.
We sincerely hope that this manual will prove of invaluable assistance both for the workshop and customer alike.

STEYR-DAIMLER-PUCH
OF AMERICA CORPORATION
GREENWICH, CONN. 06830

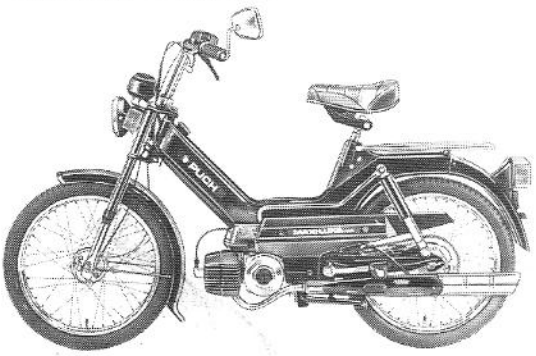
'80/'81 MODELS

THIS SERVICE MANUAL COVERS THE FULL RANGE
OF 1980/81 MODELS AS LISTED BELOW.

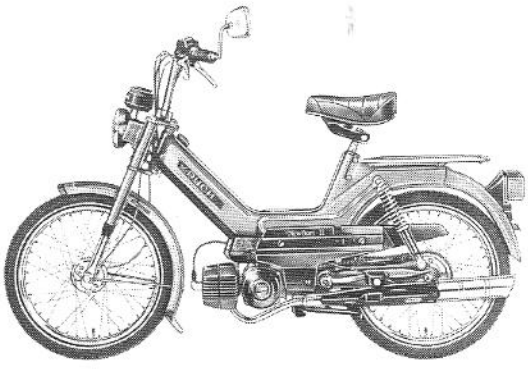
MAXI



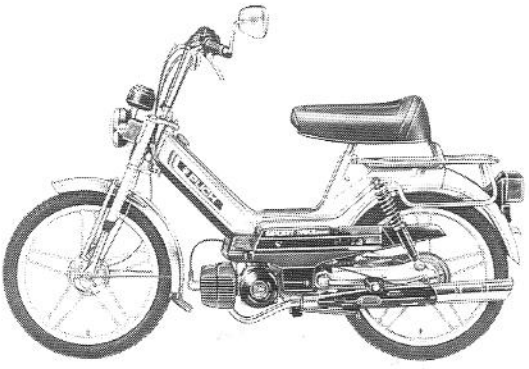
MAXI LUXE



NEWPORT II



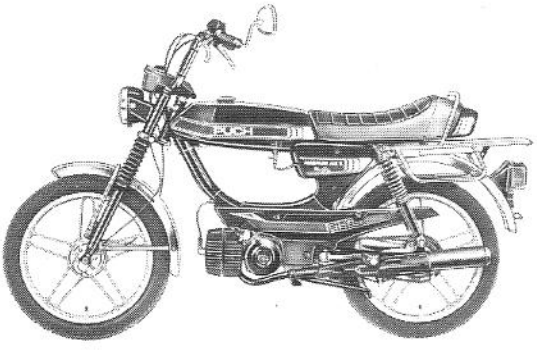
SPORT MK II



MAGNUM II



MAGNUM MK II



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LUBRICATION AND MAINTENANCE

ROUTINE MAINTENANCE SCHEDULE:

The required maintenance is clearly described in the following pages, and should be performed at the mileage intervals shown in the following chart.

LUBRICATION & MAINTENANCE CHART

	Frequency in miles (km)					
	First	Every				
OPERATIONS TO PERFORM	300 (480)	600 (960)	900 (1450)	1800 (2900)	3600 (5800)	7200 (11600)
Tire wear and condition	x	x	x	x	x	x
Throttle cable adjustment	x				x	x
Check tire pressure	x	x	x	x	x	x
Check Transmission ATF level			x	x	x	x
Clean and lubricate chain	x		x	x	x	x
Clean air filter	x			x	x	x
Change gearbox oil	x				x	x
Check spark plug	x		x	x	x	x
Decarbonize engine				x	x	x
Clean Exhaust baffle				x	x	x
Retighten screws, nuts (inc. head nuts)	x			x	x	x
Clean fuel valve and lines					x	x
Clean carburetor (filter screen, float chamber)				x	x	x
Idle speed adjustment	x			x	x	x
Check ignition timing					x	x
Adjust clutch	x				x	x
Check brakes (linings every 900)	x		x	x	x	x
Check/lubricate hub bearings					x	x
Steering bearing adjust/lubricate					x	x
Check chain tension/adjust	x		x	x	x	x
Lubricate front fork						x
Retighten upper fork bridge bolts	x	x	x	x	x	x

NOTE: Above time schedule applies to vehicles used on dry paved surfaces. If used in wet, muddy or sandy areas, maintenance should be more frequent. Always check controls and lighting before any trip.



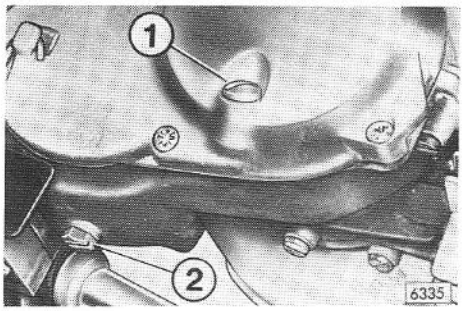
Look for this symbol to point out important safety precautions. It means - Attention! Become alert!

LUBRICATION AND MAINTENANCE

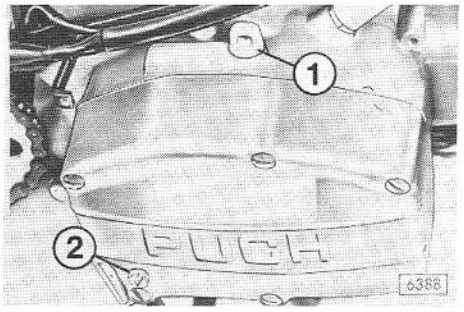
LUBRICATION

Changing Gearbox oil

1) Warm up the engine. Stop engine.
2) Remove oil drain plug (2) and filler plug (1).
3) Drain Oil.
4) Replace drain plug.
5) 1 speed automatic:
   Fill with fresh automatic transmission fluid - TYPE F only (oil capacity 5.74 oz (170 cc) to bottom of oil fill hole.
   2 speed automatic:
   Fill with fresh automatic transmission fluid - TYPE F only (oil capacity 9.5 oz (280 cc) to bottom of oil level plug.
6) Replace oil fill plug.



1-SPEED AUTOMATIC



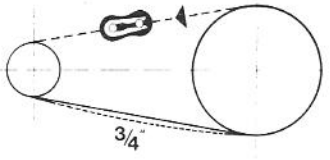
2-SPEED AUTOMATIC

Cleaning and oiling the chains

⚠ Engine should not be running.

Both engine drive and pedal chains should be kept clean. Every few hundred miles wipe chains thoroughly with a cloth, and using a small brush, lubricate with chain oil lubricant. Always keep chains properly adjusted. The proper slack of the drive chain schould be 3/4 in. (2 cm). To adjust the chains, loosen the axle nuts and tighten or loosen the rear adjuster nuts. Once chains are properly adjusted, tighten the axle nuts. Make sure that wheels are always aligned.

Drive Chain



Kickstand lubrication

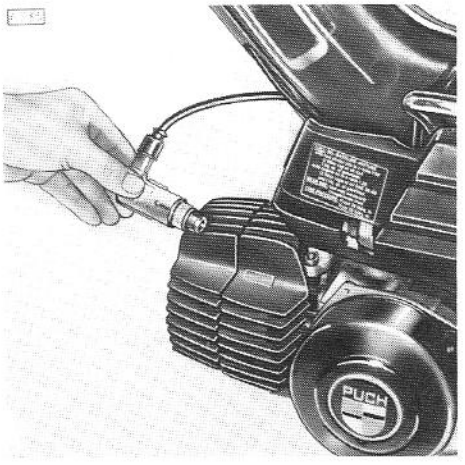
Remove the stand spring. Remove three hexagon bolts. Remove stand. Grease both halves of the stand pivot with a good automotive lithium base grease.

Adjusting Screws and Pivot Bolts

Lubricate adjusting screws, tensioning screws and pivot bolts on control levers with a few drops of oil.

MAINTENANCE

Please contact an authorized PUCH Dealer for work you do not wish to carry out yourself. The agent will be pleased to advise and help.



Checking spark plugs

Unscrew spark plug. Insert spark plug into suppressor on spark plug wire and touch spark plug electrode to a ground, such as the cylinder head. A strong spark must be visible between the spark plug electrodes when operating the starter. Oily plugs or dirty electrodes do not spark and must be cleaned first with a piece of wood or a steel wire brush. The electrode gap should be from .016 – .020 in. (0,40 to 0,50 mm), if larger, adjust by bending the ground electrode. When replacing the spark plug ensure thread matches properly and the plug can be screwed in easily. Never apply force. Screw in plug by hand for 2 to 3 turns before using the spark plug spanner. Torque to 14.5 ft/lb (20 Nm).

MAINTENANCE

Decarbonizing the engine

Carbon deposits on the cylinder head, piston crown and in the exhaust ports are normal with all two-stroke engines and can eventually lead to trouble if not removed in time. Combustion deposits from oil as well as from fuel must therefore be removed regularly.

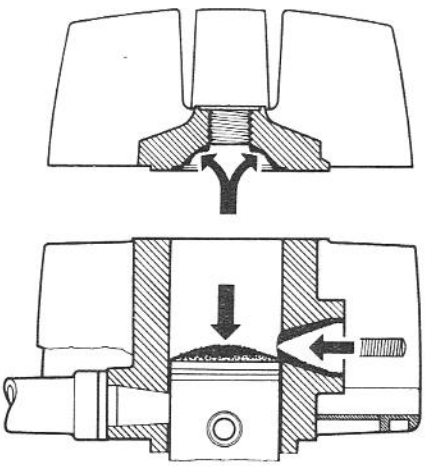
Cylinder head and piston crown

Carbon deposits on the cylinder head and piston crown should be removed only with a soft, blunt edged instrument to avoid damage to the light alloy casting. Scratching should be avoided since every new scratch will collect more carbon in future use.

Only scaly deposits need be removed from the piston crown. There is no need to disturb the piston if it is covered only by a uniform layer of oil carbon. Before refitting the cylinder head, thoroughly remove all carbon deposits and scrapings from the cylinder wall with a non fraying soft cloth and smear the surface lightly with motor oil. Turn over the engine a few times tomake sure it cranks easily. Clean the mating surfaces with a clean rag. Replace the cylinder head and tighten the four cylinder head nuts. Be sure to tighten two cylinder head nuts diagonally across from each other before tightening the other two nuts (7 ft/lb/10 Nm).

Exhaust port

In order to clean the exhaust port, remove the exhaust pipe. Crank the engine over (with the spark plug removed to reduce compression) until the piston reaches its lowest point. Remove the oil carbon from the exhaust port. Take care not to damage the piston or cylinder surface. When cleaning the exhaust port, it is also a good idea to clean the muffler.

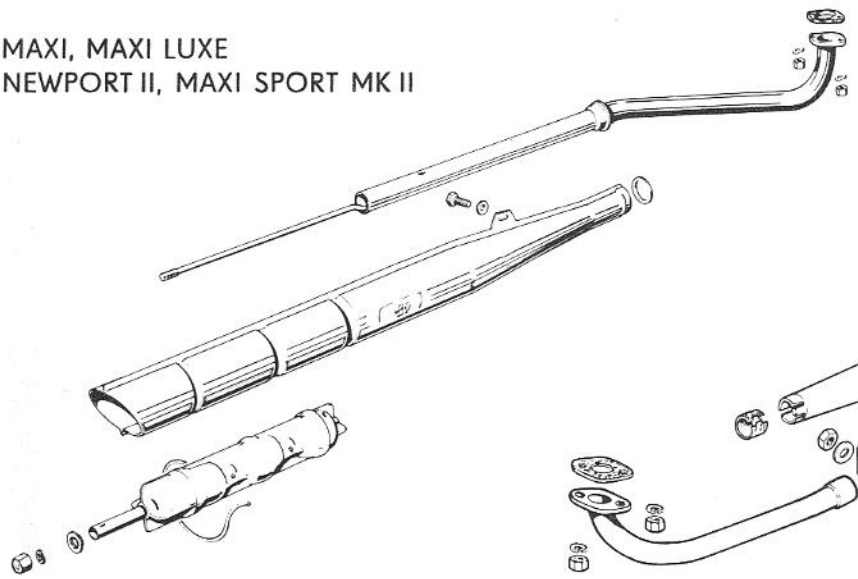


Cleaning the muffler

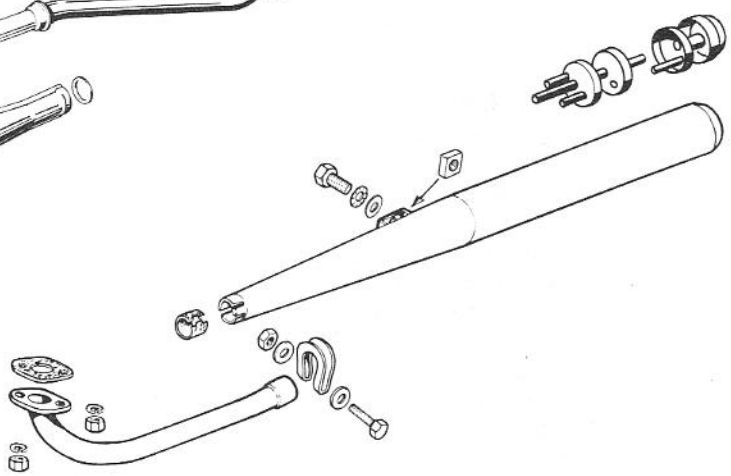
Unscrew and pull off the exhaust endpiece. Remove oil-carbon deposits from the inside of the muffler using a scraper. Also carefully remove the oil deposits from the exhaust baffle and the exhaust endpiece. Replace the gasket if necessary.

NOTE: For further break-down of exhaust system refer to diagram.

MAXI, MAXI LUXE
NEWPORT II, MAXI SPORT MK II

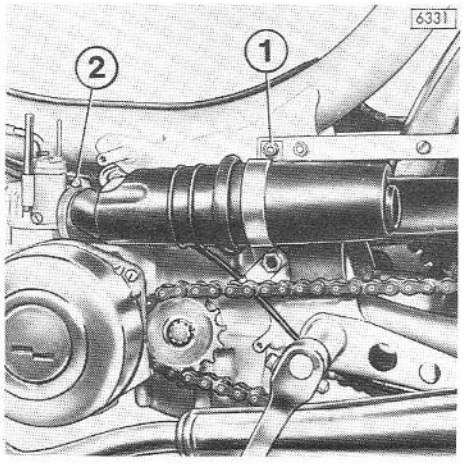


MAGNUM II
MAGNUM MK II



Cleaning the air cleaner – Magnum Series

Remove the left hand chain guard. Remove clamp nut (1). Loosen clamp screw (2) and remove air cleaner assembly from the carburetor. Remove front part of the air cleaner using a drift and carefully push out filter screen. Wash filter screen in solvent and allow it to dry thoroughly before replacing. Reassemble damper pipe, filter screen, and air cleaner assembly.



Cleaning the air cleaner – MAXI Series

The air filter on the MAXI is a non-serviceable sealed unit.

Cleaning the fuel valve and line

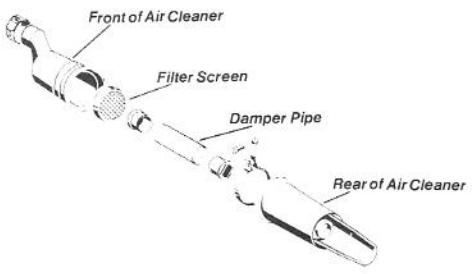
Empty fuel tank. Pull the fuel line from the fuel valve and blow air thru line until clear. Unscrew the fuel valve. Clean the valve and strainer by washing with solvent.

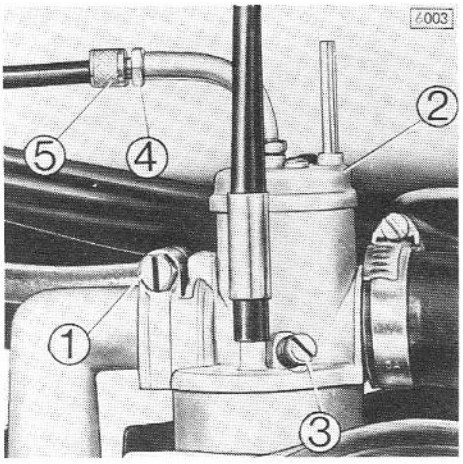
Cleaning the carburetor

Maintenance operations on the carburetor are outlined: under "CARBURETOR" page 57.

Cleaning the main jet, needle jet and float chamber

1) Close the fuel valve.
2) Remove the left hand chain guard.
3) Remove the air cleaner.
4) Loosen carburetor clamping screw, see page 10 (1).
5) Pull the fuel pipe from the carburetor.
6) Turn the carburetor with its float chamber line (bottom) towards the clutch side and pull off.
7) Loosen screws and pull out the top parts, see page 10 (2) with throttle slide and pull off.
8) Screw off the float chamber.
9) Unscrew the main jet from the needle jet and clean by blowing through or by using a stiff bristle. Never use a piece of wire. Also unscrew needle jet and clean.
10) Clean the float chamber with gasoline.
11) Wash carburetor body and blow through. Make sure that the bores are not clogged with dirt.
12) When refitting the jets, tighten them properly.





CARBURETOR ADJUSTMENT

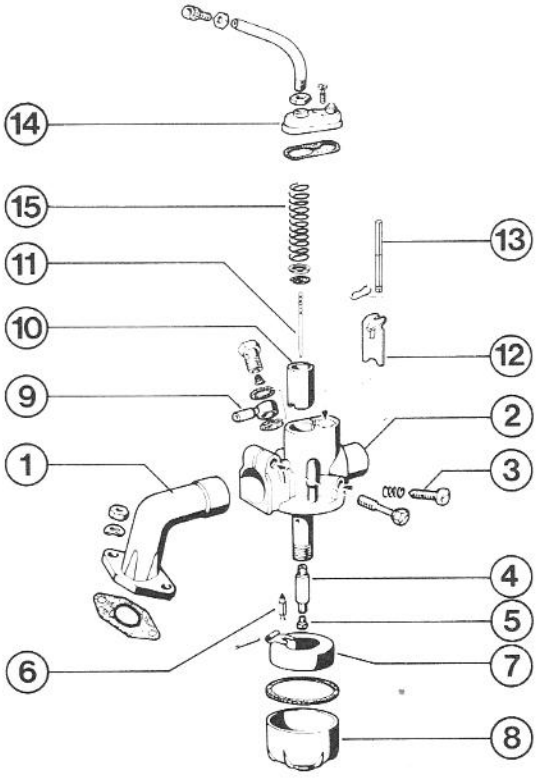
Minor carburetor adjustment may be required to compensate for differences in fuel, temperature, altitude and load.

IDLE ADJUSTMENT

Start engine and run at moderate speed until operating temperature is reached. Adjust idle speed by turning idle adjustment screw (3) in or out until engine runs smoothly.

THROTTLE CABLE ADJUSTMENT

Check for proper throttle cable slack (.040 in./1,0 mm). Insufficient cable slack will hold the throttle partially open and the idle adjusting screw will not function. If necessary, loosen the cable locknut (4) and turn the throttle cable adjuster (5) to the right to increase cable slack. Retighten the cable locknut.



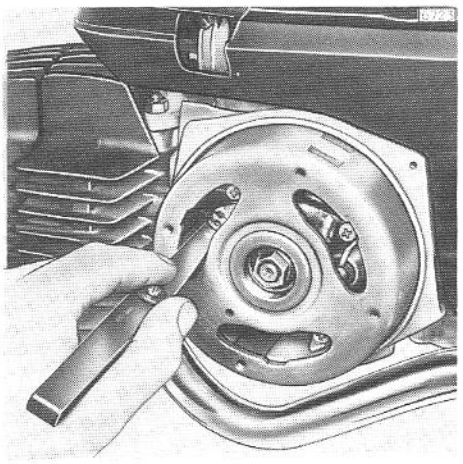
Exploded view of the carburetor

1 Intake manifold
2 Carburetor body
3 Throttle slide stop screw (Idle screw)
4 Needle jet
5 Main jet
6 Float needle
7 Float
8 Float bowl
9 Hose swivel connector
10 Throttle slide
11 Jet-needle
12 Choke slide
13 Choke lever
14 Top cover
15 Slide spring

CHECKING THE IGNITION SYSTEM

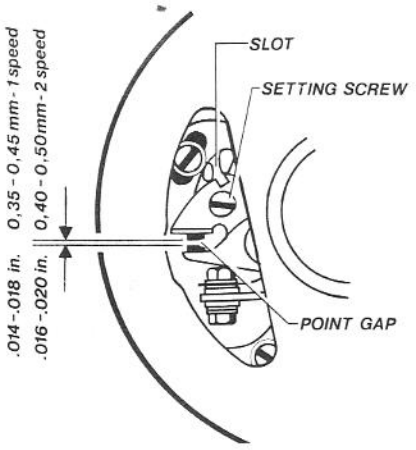
Ignition timing

The engine will reach maximum output only if the ignition is correctly adjusted. See Ignition Timing page 110.



Breaker point gap

Check the point gap every 3600 miles (5800 km). Remove the magneto cover located on the left side of the engine. Rotate the flywheel until the breaker points are fully open and visable through one of the flywheel windows. Breaker points that are burnt should be replaced.
Measure breaker points gap with a feeler gauge (.014 – .018 in./0.35 – 0.45 mm for 1 speed, .016 – .020 in./0.40 – 0.50 mm for 2 speed). To adjuste the breaker points gap, loosen the set screw slightly, insert a screwdriver blade into the slot on the breaker plate and turn the screwdriver slightly until the correct gap is obtained. Tighten the set screw and check that the gap has not altered.

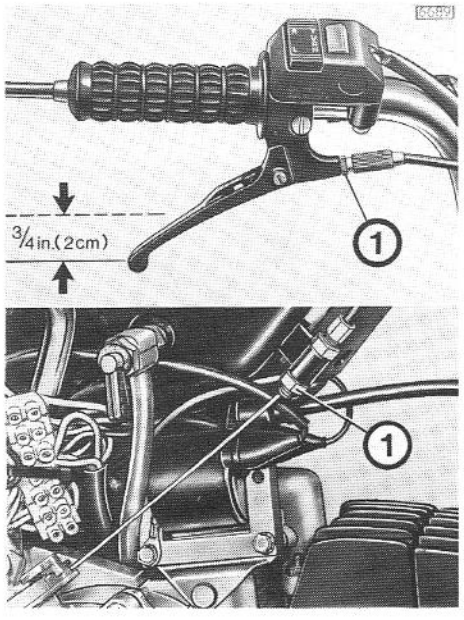


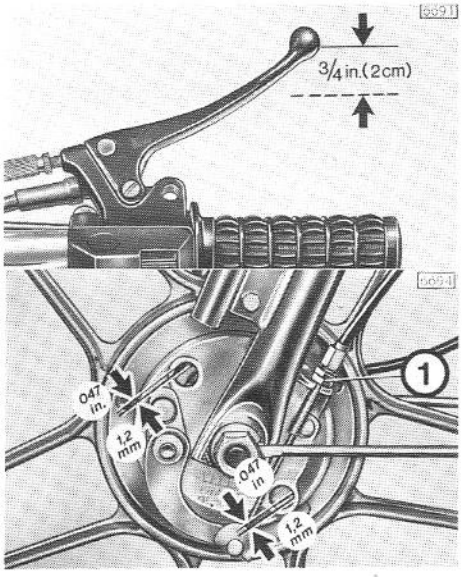
2-speed

Adjusting the starting lever

After the first 300 miles (480 km) and then every 3600 miles (5800 km) check adjustment of the starting lever. The free play at the starting lever (measured at the end of the lever) should be 3/4 in. (2 cm). Correct play is achieved by loosing the locknut (1) and turning the adjuster until the correct lever travel is obtained. Tighten the locknut.

1-speed

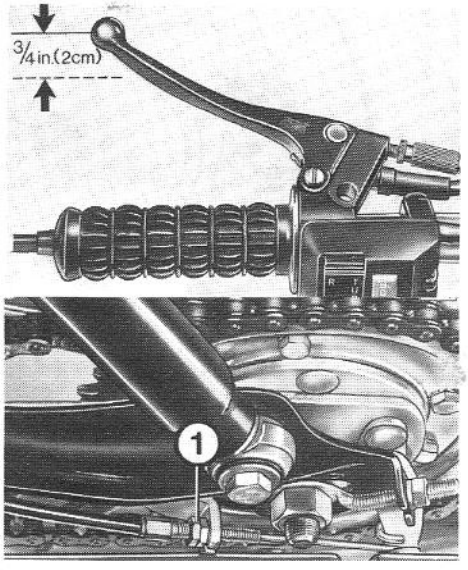




Checking the brakes

Front brake

The correct adjusted travel (measured at the end of the handbrake lever) is 3/4 in. (2 cm). To adjust, loosen the locknut (1) and turn the adjuster until brake lever travel is 3/4in. (2 cm). Tighten the locknut.



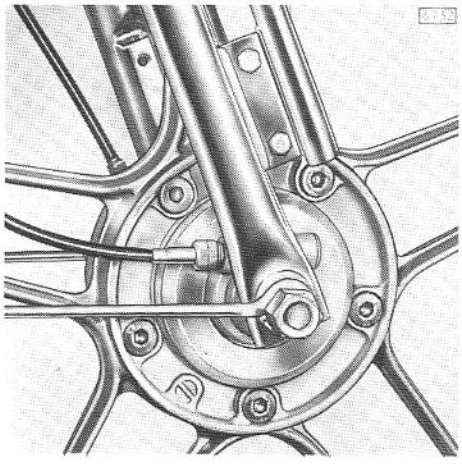
Rear Brake

The correct travel (measured at the end oft the handbrake lever) is 3/4 in. (2 cm). To adjust, loosen the locknut (I) and turn the adjuster until brake lever travel is 3/4 in. (2 cm). Tighten the locknut.

Brake linings

Pry plastic inspection plugs from wheel hub. Disconnect brake cable from brake lever. Insert a feeler gauge between brake drum and brake lining. Gap should not exceed .047 in. (1,2 cm) at either inspection hole. If gap exceed this measurement, refer to section "BRAKES" on brake replacement.

⚠ Do not operate your unit.

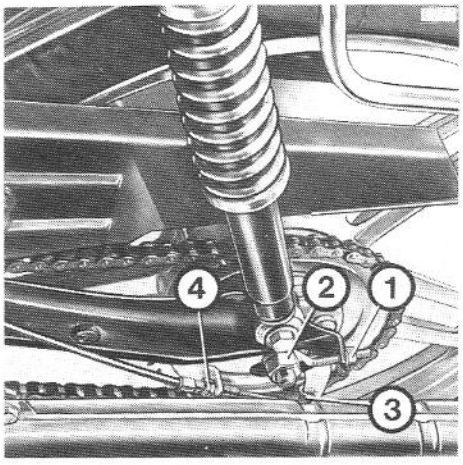


FRONT WHEEL REMOVAL

Unscrew speedometer cable from hub. Loosen locknut on brake cable and remove brake cable from hub. Remove the axle nuts. Remove wheel from fork.
To replace wheel reverse the above procedure. Torque axle nuts to 20 ft/lb (27 Nm). Be certain to readjust the brake before riding.

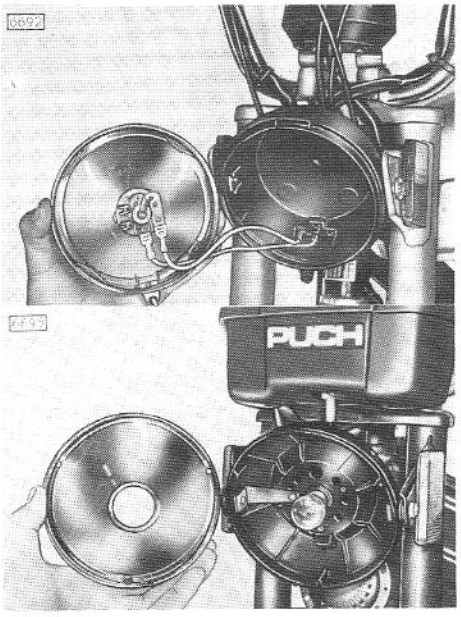
REAR WHEEL REMOVAL

Loosen the two chain adjusters (1). Loosen both axle nuts (2). Loosen the brake cable locknut (4) and remove brake cable from brake arm (3). Remove the chain adjusters. Push wheel forward. Remove the two chains from their sprockets. Tilt machine to the left and remove the wheel.
To replace wheel reverse the above procedure (see page 97). Be certain to readjust the brake before riding.



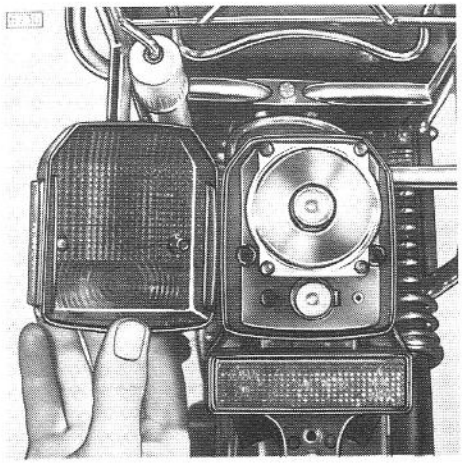
REPLACING HEADLIGHT

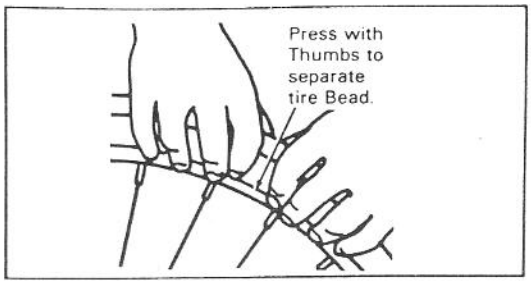
Remove headlight rim retaining screw(s) and remove reflector. Turn bulb to the left and remove (see "Technical Data" sheet for size of bulb).

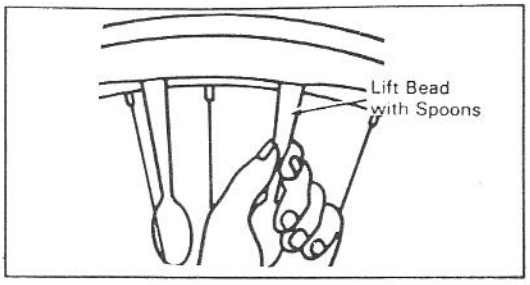


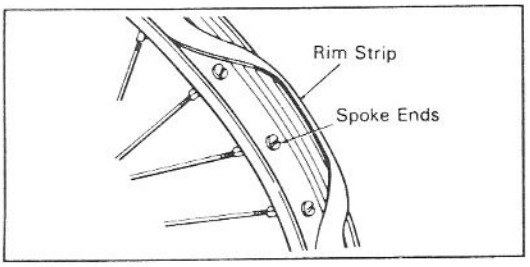
REPLACING REAR LIGHT BULB AND STOP LIGHT BULB

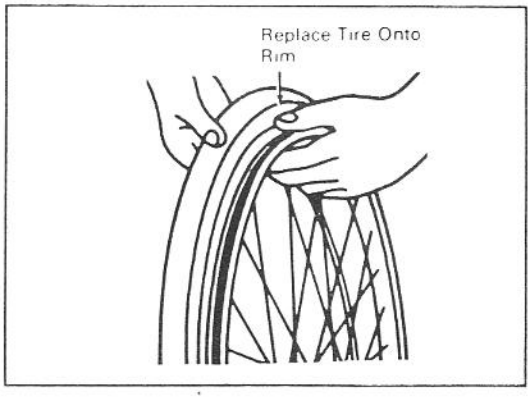
Remove the two screws that hold the lense. Remove bulb and replace (see the "Technical Data" section for size of bulb).
Stop light bulb (top) and rear light bulb (bottom).

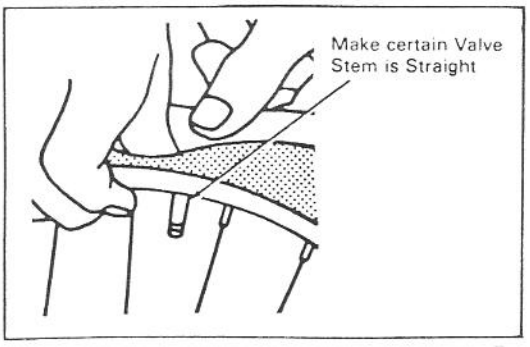












TIRE REMOVAL

1. Let air out of the tire by removing the valve core. Push valve stem thru hole in rim.
2. Separate the tire bead from the sides of the rim by pressing with the thumbs. Work your way around the tire on both sides to be sure that the bead of the tire is not sticking to the rim.
3. Use tire tools or spoons with rounded ends to lift the bead on one side of the tire off the rim. Be careful not to pinch the inner tube between the tire tools and the tire bead or the rim.
4. Pull the inner tube out from between the tire and rim.
5. Lift the bead of the tire up over the side of the rim and pull off tire.

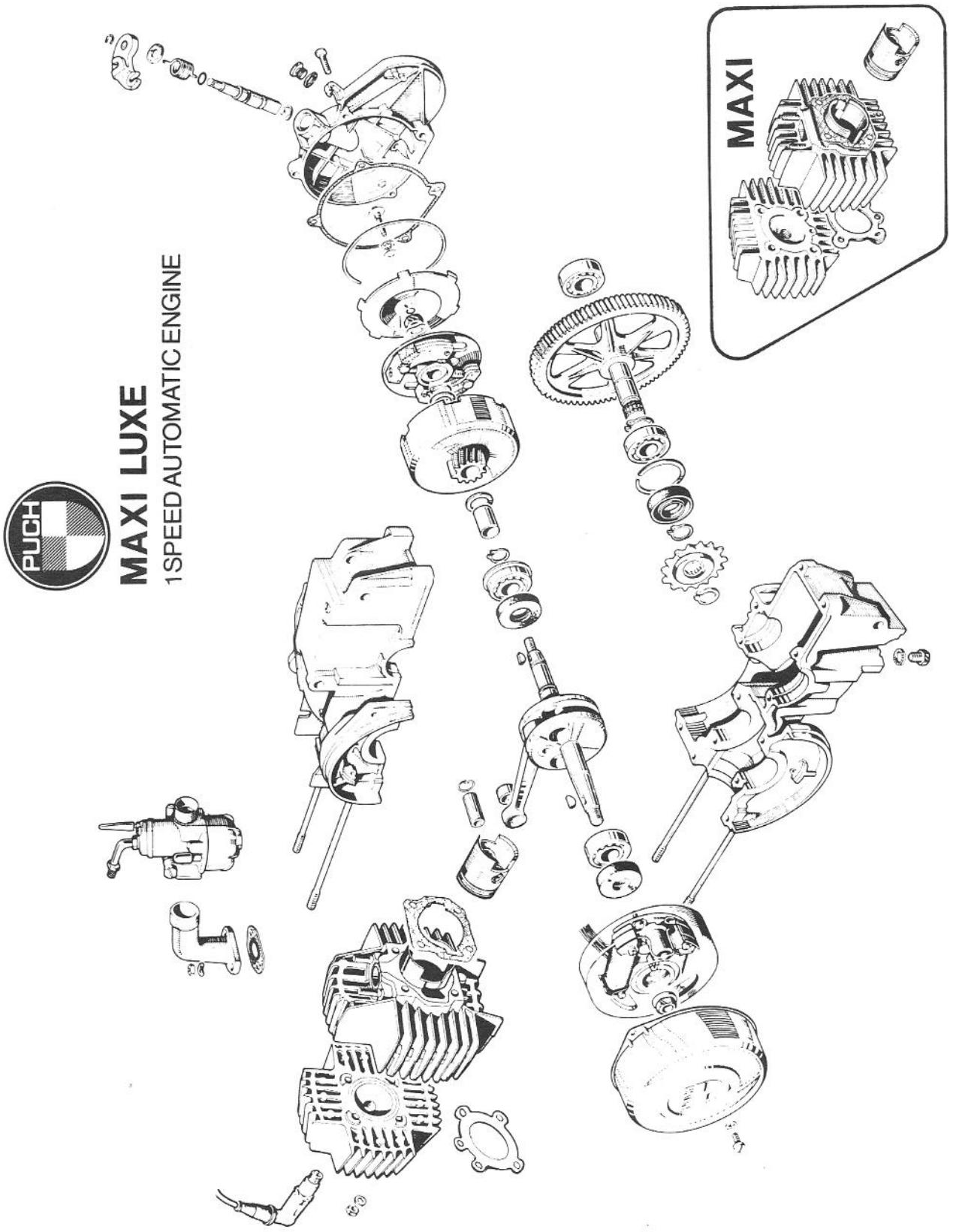
TIRE INSTALLATION

1. Check the rim strip to be sure it is covering all spoke ends.
2. Wet tire bead with soapy water. Roll the tire bead, on one side of the tire, onto the rim. Put the tube into the tire and inflate it only enough to hold the tube during assembly.
3. Make certain that valve stem is protruding squarely though the rim. At this point it may be desirable to let some air out of the inner tube to make the next step easier.
4. Starting in the area of the valve stem, press the other tire bead onto the rim using both hands. Work your way to the opposite side of the wheel. Be careful to not pinch the tube between the tire bead and the rim. If the last few inches of the bead cannot be pressed onto the rim by hand, a rubber hammer may be used to get the tire over the rim. Be careful to not pinch the inner tube.

Use only a hand pump or foot pump to inflate tires. Because of the small volume capacity of tires, service station air hoses inflate tires very rapidly. They are also usually capable of pressure beyond that which the tire can hold.

5. Inflate the tire to about half the recommended pressure and check to see that the tire bead is seated properly on the rim. If it isn't, use thumb pressure to seat bead.
6. Inflate the tire to full pressure.

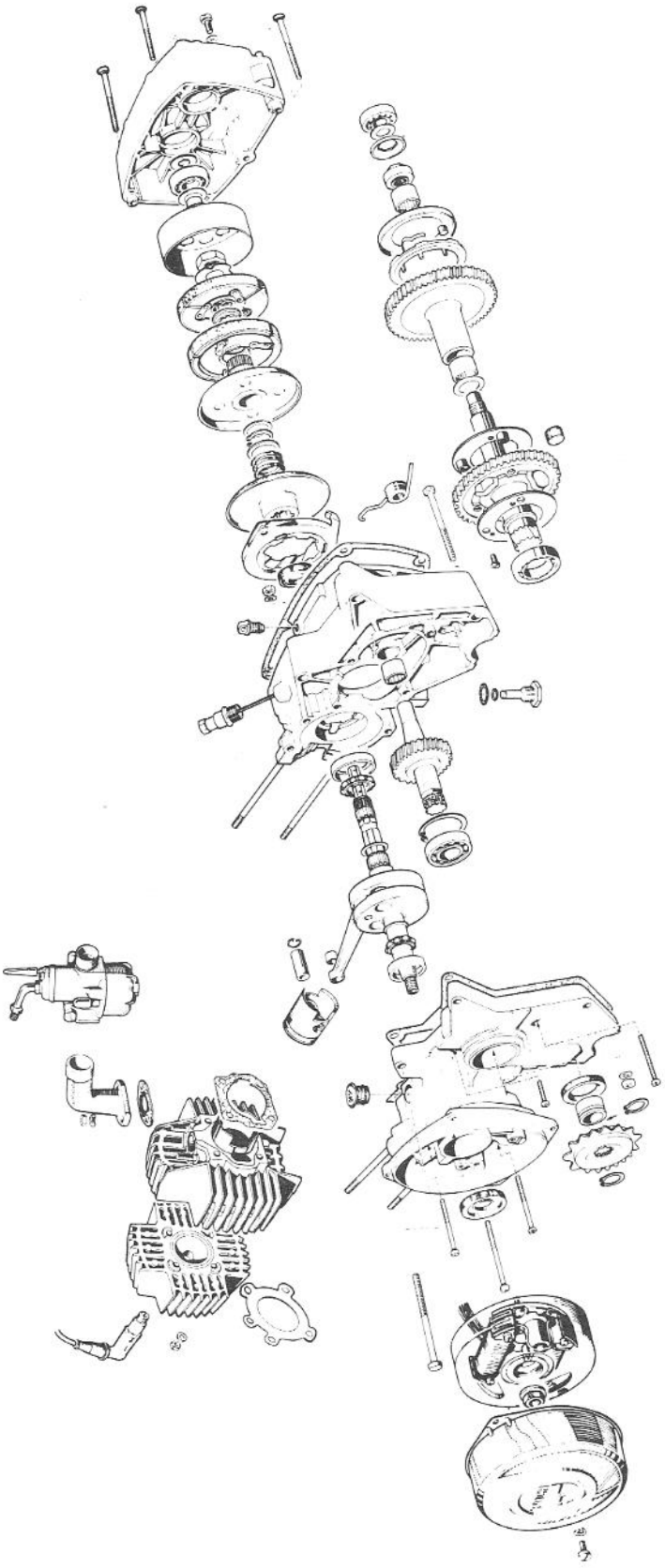
EXPLODED ENGINE VIEW



EXPLODED ENGINE VIEW

NEW PORT II · MAXI SPORT MK II

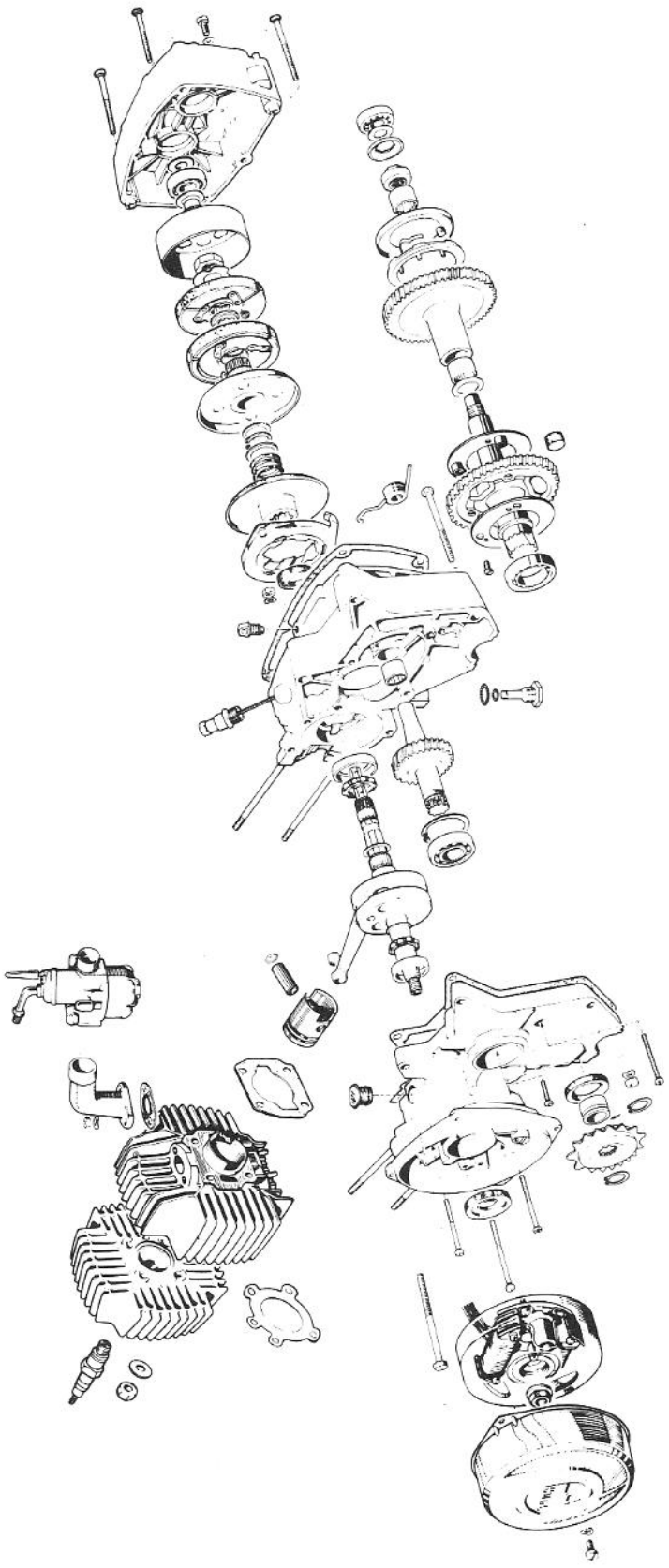
2 SPEED AUTOMATIC ENGINE



EXPLODED ENGINE VIEW

MAGNUM II

2 SPEED AUTOMATIC ENGINE



EXPLODED ENGINE VIEW

MAGNUM MK II

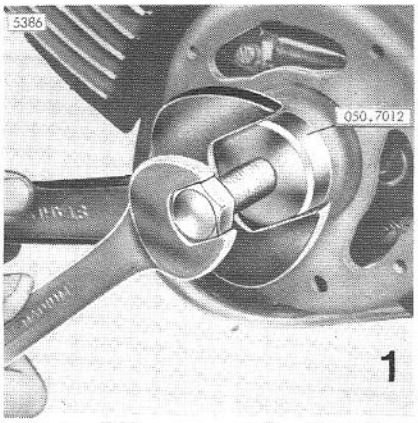
2 SPEED AUTOMATIC OIL INJECT



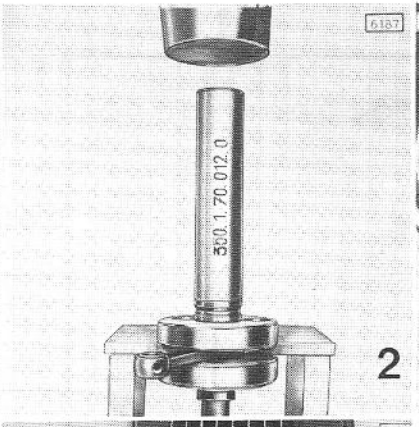
COMPLETE SPECIAL TOOL LISTING USAGE/KIT CONTENTS

Pic.	Part	Description	GN	Maxi	Luxe	Sport I	Newport/L	Newport 0/I	Magnum XK	Maxi II	Newport II	Sport MK II	Magnum II	Magnum MK II		Magnum X (JMX)		1-Speed Tool Kit 905.6.90.902.9	2-Speed Tool Kit Small 905.6.40.002.0	Large Tool Kit 905.6.40.004.0
1	050.7012	Flywheel Extractor	O	O	O	O	O	O	O	O	O	O	O	O		O		O		O
–	278	Dial Indicator	O	O	O	O	O	O	O	O	O	O	O	O		O		Seperate Order Only		
2	350.1.70.012.0	Bearing Installation Sleeve	O	O	O	O	O	O	O	O	O	O	O	O		O		O		O
3	905.0.12.101.0	Ignition Timing (Buzz) Box	O	O	O	O	O	O	O	O	O	O	O	O		O		O		O
–	905.0.14.001.0	Kukko-Puller 22-2								O	O	O	O	O						O
4	905.0.14.002.0	Kukko-Puller 22-1								O	O	O	O	O						O
4	905.0.14.006.0	Kukko-Remover 21/2								O	O	O	O	O						O
–	905.0.14.010.0	Kukko-Remover 21/6								O	O	O	O	O						O
–	905.0.14.017.0	Kukko-Remover 21/02								O	O	O	O	O						O
5	905.0.16.101.2	Flywheel Locking Spanner	O	O	O	O	O	O	O	O	O	O	O	O		O		O		O
–	905.0.31.101.2	Assembly Table								O	O	O	O	O						O
6	905.0.33.104.1	Crankshaft Support Table	O	O	O	O	O	O	O	O	O	O	O	O		O		O		O
7	905.0.34.101.0	Main Bearing Puller	O	O	O	O	O	O	O	O	O	O	O	O		O		O		O
8	905.6.17.101.0	Reamer compl.	O	O	O	O	O	O	O	O	O	O	O	O		O				O
–	905.6.31.106.2	Engine Holder (non-rotating)	O	O	O	O	O	O	O	O	O	O	O	O		O		Seperate Order Only		
9	905.6.31.108.1	Installation Sleeve								O	O	O	O	O					O	O
10	905.6.32.101.0	Dial Indicator Holder (incl. with 278)	O	O	O	O	O	O	O	O	O	O	O	O		O				O
11	905.6.32.107.0	Main Bearing Measuring Device								O	O	O	O	O					O	O
12	905.6.32.109.0	Transmission Measuring Device								O	O	O	O	O					O	O
13	905.6.33.105.0	Small End Bushing Remover/Installer	O	O	O	O	O	O	O	O	O	O	O	O		O				O
14	905.6.33.111.2	Bearing Installation Sleeve								O	O	O	O	O		O			O	O
15	905.6.33.112.1	Seal Installer								O	O	O	O	O					O	O
–	905.6.34.105.0	Main Bearing Puller Cages								O	O	O	O	O					O	O
16	905.6.34.109.0	Clutch Hub Puller	O	O	O	O	O	O	O							O		O		O
–	905.6.34.110.0	Main Bearing Puller Cages								O	O	O	O	O					O	O
7	905.6.34.111.0	Main Bearing Puller Cages	O	O	O	O	O	O	O							O		O		O
17	905.6.34.113.0	Puller Cages Oil Pump Gear						O						O					O	O
18	905.6.34.501.0	Bearing Cup Installer	O	O	O	O	O	O	O	O	O	O	O	O		O				O
19	905.6.35.401.2	Spoke Spanner	O	O	O		O	O	O	O	O		O			O				O
20	905.6.35.402.1	Hub Cone Spanner	O	O	O	O	O	O	O	O	O	O	O	O					O	O
21	905.6.35.404.0	Sprocket Spanner	O	O	O	O	O	O	O	O	O	O	O	O				O		O
22	905.6.36.108.0	Engine Holder (rotating type)	O	O	O	O	O	O	O	O	O	O	O	O		O				O
23	905.6.36.109.2	Second Gear Locking Device								O	O	O	O	O					O	O
23	905.6.36.110.2	Clutch Locking Device								O	O	O	O	O					O	O
–	905.6.36.111.1	Clutch Locking Device (Newport Auto/St.)						O												O
24	905.6.41.101.2	Spring Pliers								O	O	O	O	O					O	O
–	906.6.21.001.0	PUCH Low Scale Ohmmeter	O	O	O	O	O	O	O	O	O	O	O	O		O		Seperate Order Only		
–	906.6.22.002.0	PUCH Ignition Tester	O	O	O	O	O	O	O	O	O	O	O	O		O		Seperate Order Only		

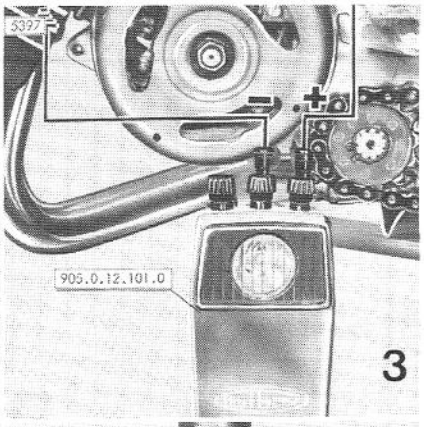
SPECIAL TOOLS



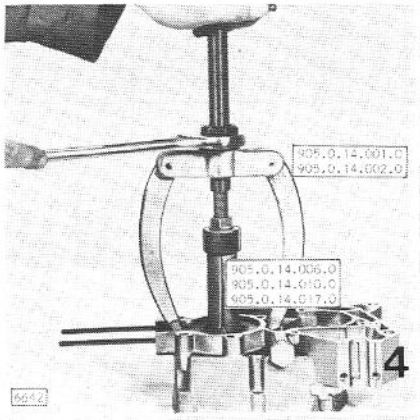
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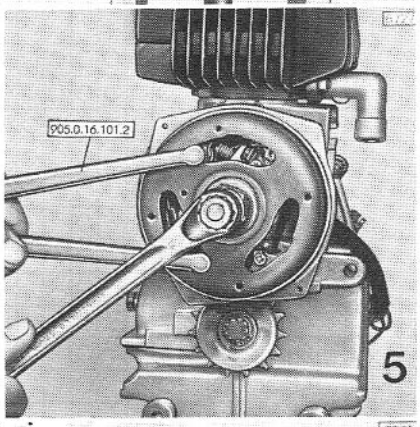
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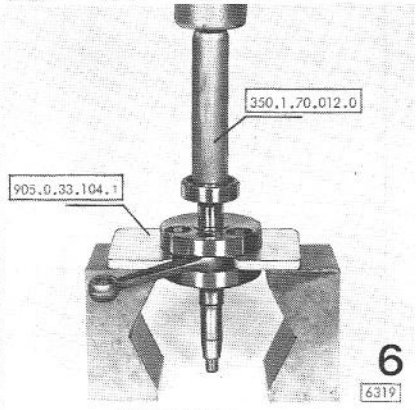
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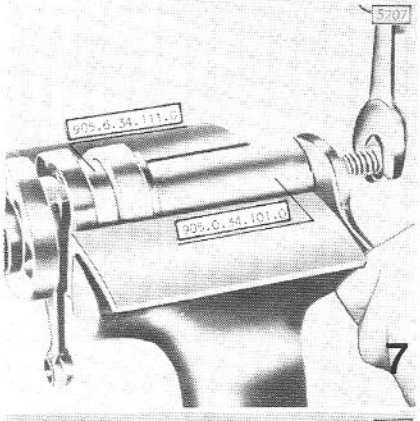
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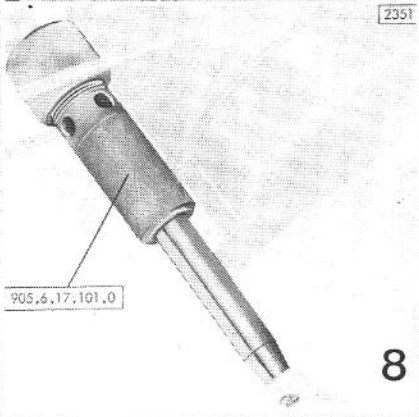
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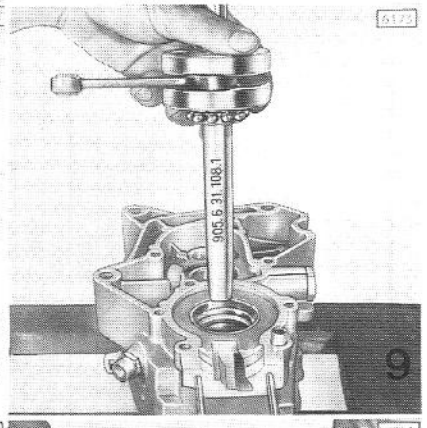
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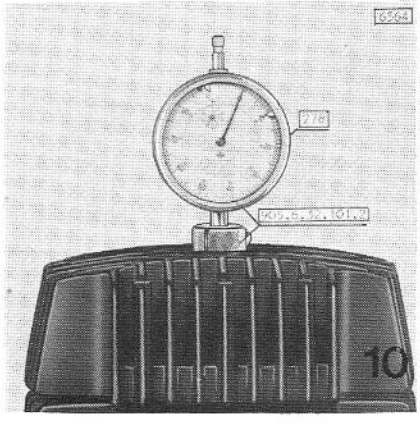
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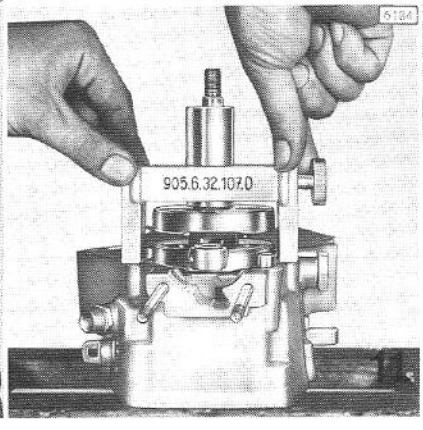
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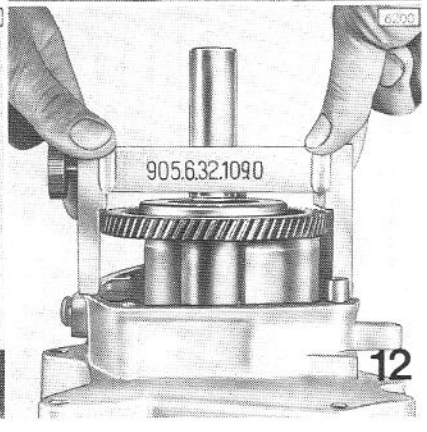
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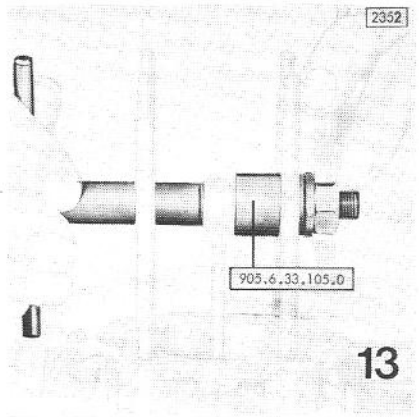


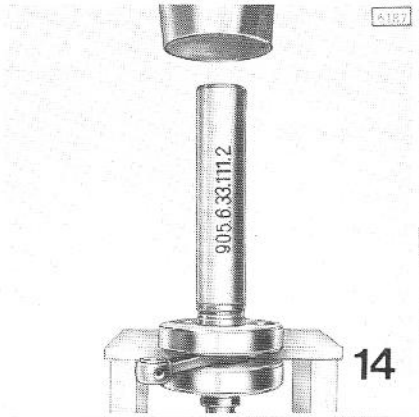
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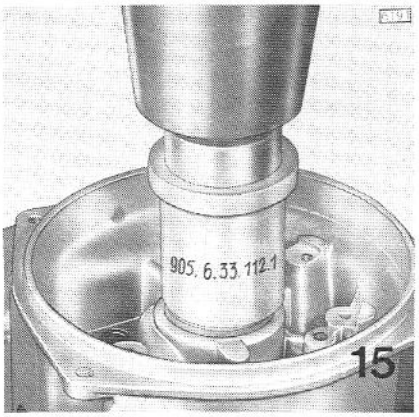


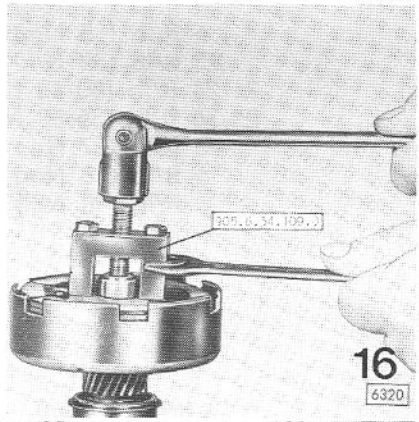
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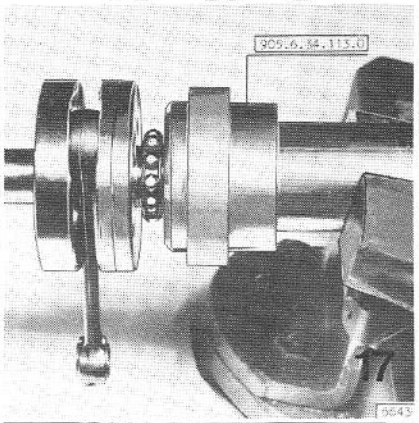
SPECIAL TOOLS

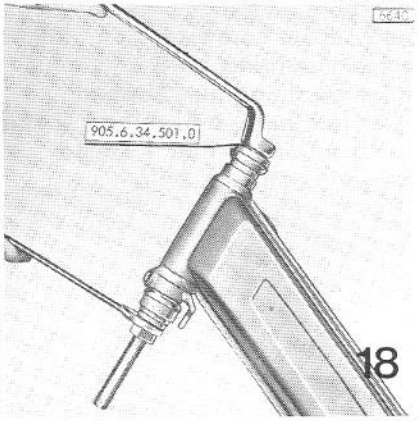


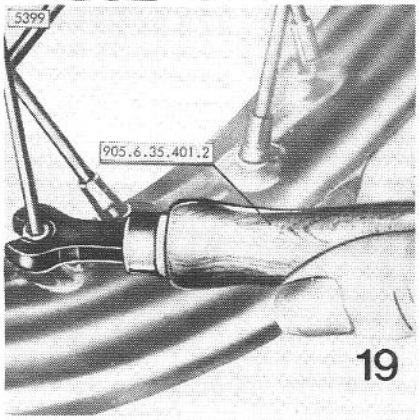


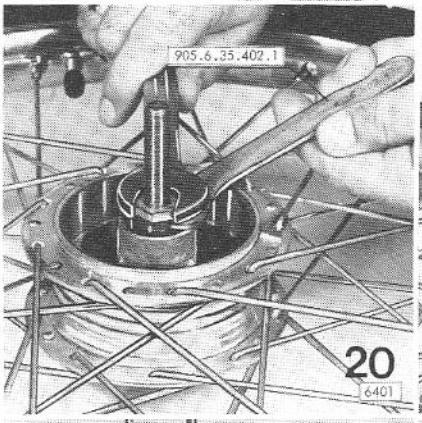


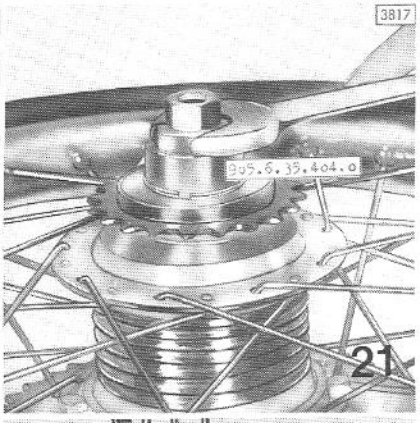


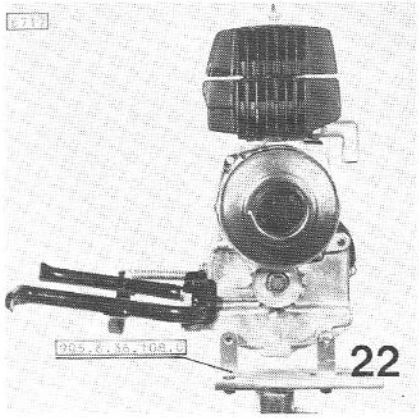


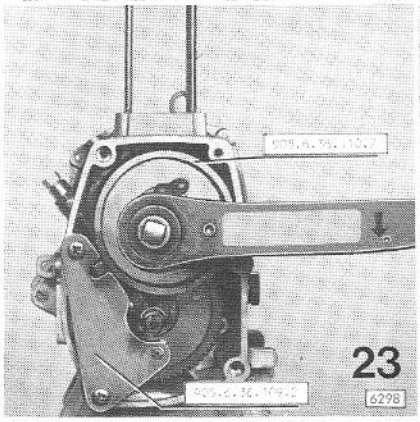


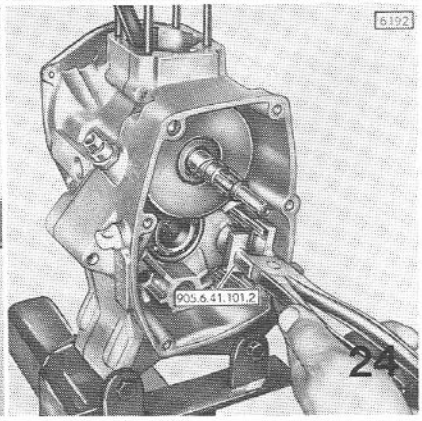












TORQUE SPECIFICATION

The torque reading in foot pounds is the torque required to bring any given bolt to its maximum safe stress point.
Tension is the pressure in pounds per square inch (P.S.I.) that the bolt material can stand before stretching occurs.
Tightening torque to be within a tolerance of 10%.

Engine torque specification

Spark plug	ft/lb (Nm)
Cylinder head nuts	7 ft/lb (10 Nm)
Flywheel nut	25 ft/lb (35 Nm)
Crankcase screws	6 ft/lb (8 Nm)
Clutch cover screws	6 ft/lb (8 Nm)
Engine mounting bolts	23 ft/lb (32 Nm)
Clutch retaining nut, 2 speed	21-24 ft/lb (30-40 Nm)
Roller retaining, l. h. thread, 2 speed	25-36 ft/lb (35-50 Nm)
Clutch retaining nut, 1 speed	20 ft/lb (27 Nm)
Kickstand bearing bolts	6 ft/lb (8 Nm)
Manifold mounting bolts/nuts	6 ft/lb (8 Nm)

Frame torque specification

Front/rear axle nuts	20 ft/lb (27 Nm)
Rear shock top	17 ft/lb (23 Nm)
Rear shock bottom	9 ft/lb (12 Nm)
Rear fork bearing	29 ft/lb (40 Nm)
Handlebar bolts	10-12 ft/lb (15-16 Nm)
Crank wedge nuts	5 ft/lb (7 Nm)
Fender bracket hardware	4 ft/lb (6 Nm)
Steering head nut	30 ft/lb (41 Nm)
Fork tube clamp bolts (MAGNUM MK II)	40 ft/lb (54 Nm)
Fork bridge plug screws (MAGNUM MK II)	20 ft/lb (27 Nm)
Fork bridge bolts	11 ft/lb (15 Nm)

NOTE: Nm stands for Newton-meter which is an European standard measure. Its conversion factor to receive ft/lb (foot-pounds) is 0,735.

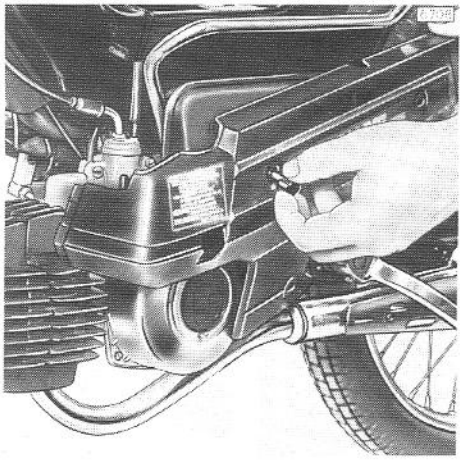
REMOVE ENGINE

ENGINE REMOVAL

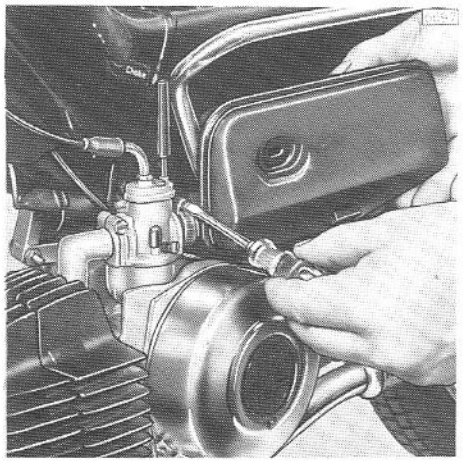
Place the moped on a bench. Secure in position on bench with tie-down straps.



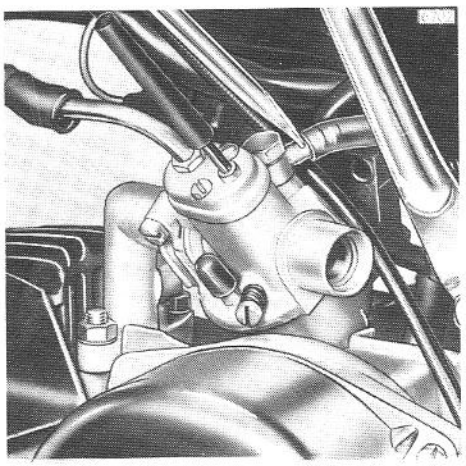
Remove left and right hand chain guards.



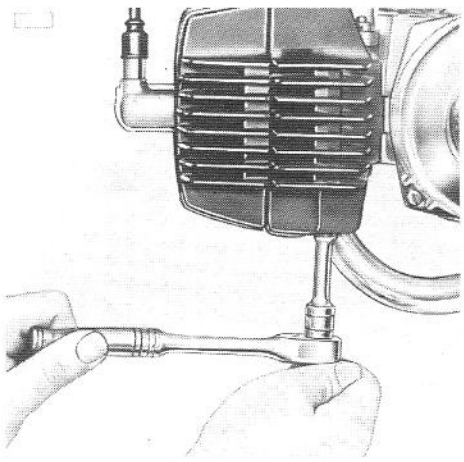
Loosen clamp screw on air filter assembly and remove.



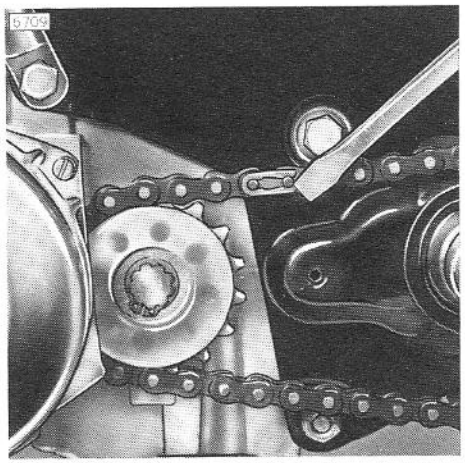
REMOVE ENGINE



Turn fuel tap to "Off" position. Disconnect fuel supply hose. Loosen carburetor clamp screw and twist carburetor to the left and remove from intake manifold.



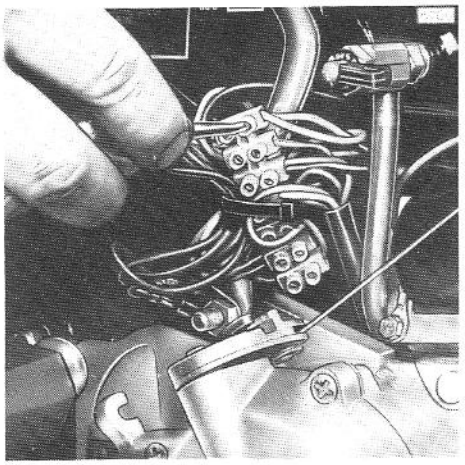
Remove both exhaust nuts on cylinder and the mounting bolt on the muffler housing. Remove exhaust system.



Disconnect drive chain by removing the master chain link.

REMOVE ENGINE

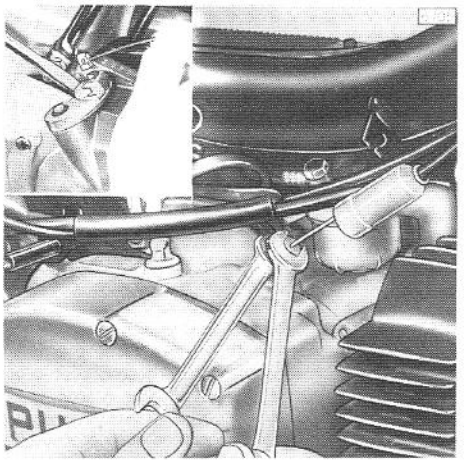
Disconnect electrical wiring at the junction block.



DISCONNECT STARTER CABLE:

1-speed automatic

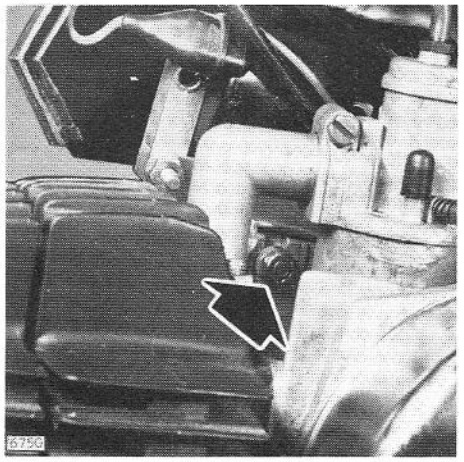
Loosen starter cable adjustment, twist clutch lever and disconnect cable from lever.



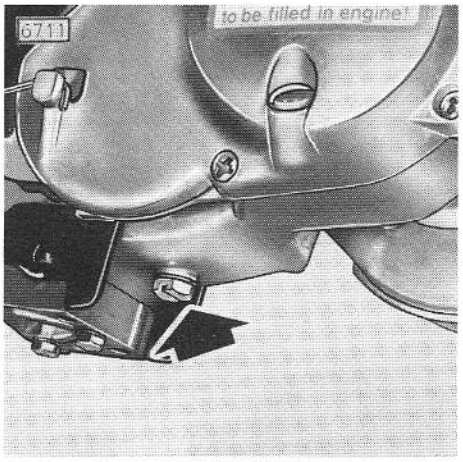
2-speed automatic

Loosen clamp screw on starter lever on the left side of handlebar.
Pull up protective plastic cap from the adjusting sleeve. Unscrew starter cable nut from adjusting sleeve. Do not loosen adjusting sleeve nor the starter cable adjusting nut.

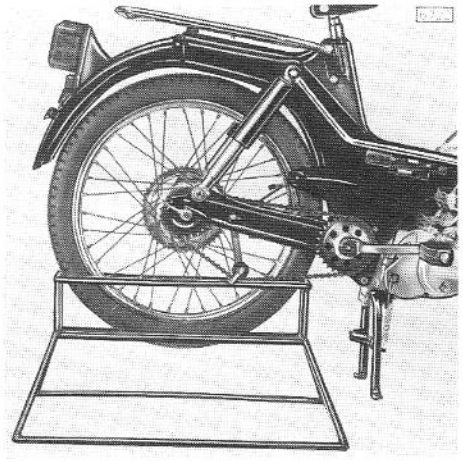
Remove suppressor plug from spark plug.
On 1-speed models remove ignition coil from engine.



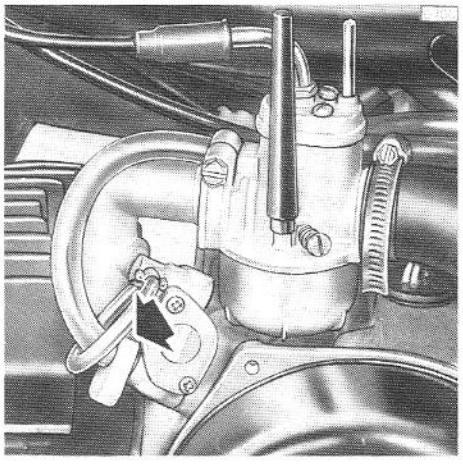
REMOVE ENGINE



Drain transmission oil.



If workbench, part no 49-34-001, is not being used place the rear wheel in a support stand.



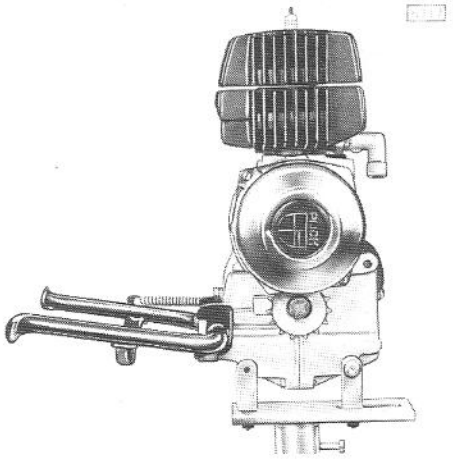
MAGNUM MK II:

Remove oil supply line from oil pump and block-off line to avoid oil drainage from oil tank.

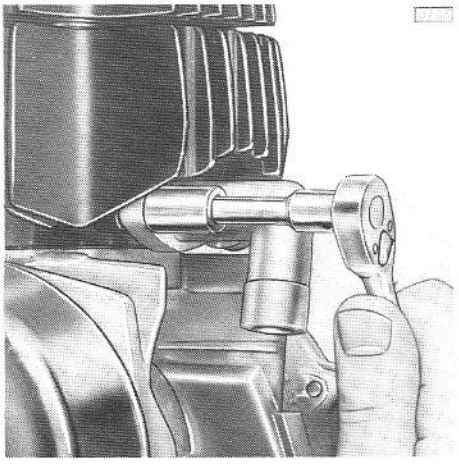
Remove the three (3) engine mounting bolts and withdraw engine from frame.

DISMANTLE ENGINE - 1 SPEED

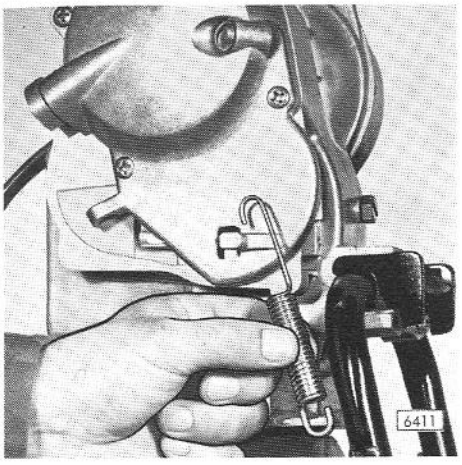
Place engine in engine holder (905.6.36.108.0) which is mounted in a vise.



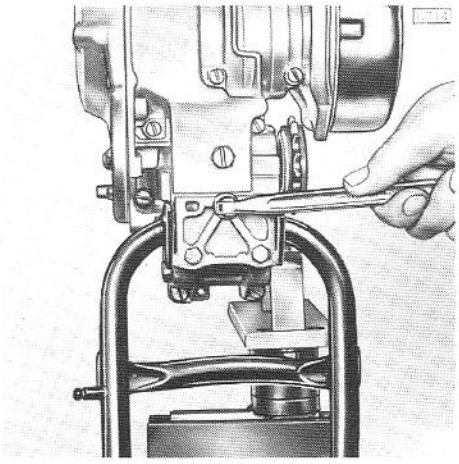
Remove intake manifold.



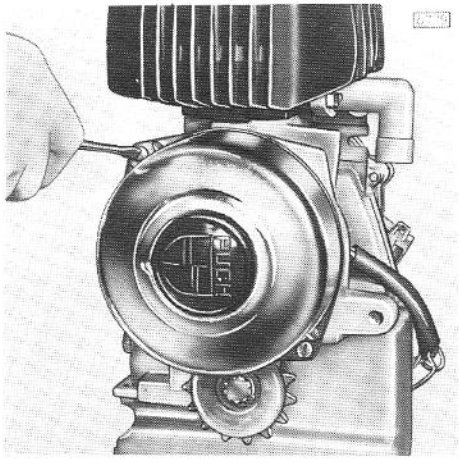
Disconnect the kick-stand spring.



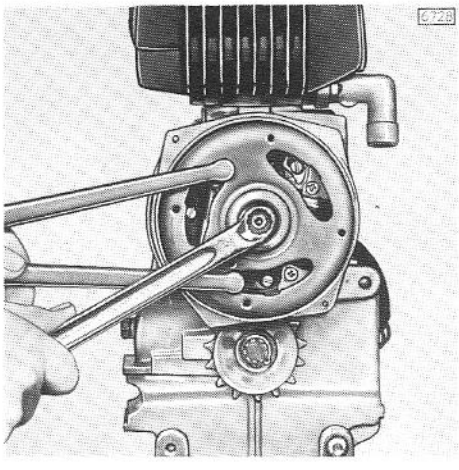
DISMANTLE ENGINE - 1 SPEED



Unscrew the kickstand bearing bolts, bearing cup and kickstand.



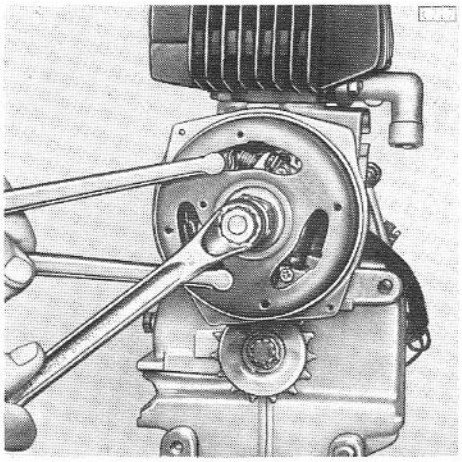
Remove generator cover.



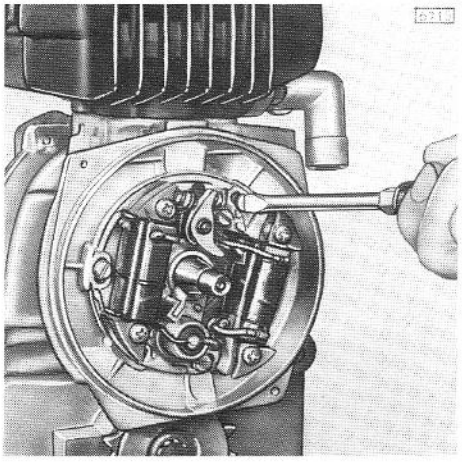
Lock flywheel with locking tool 905.0.16.101.2 and unscrew flywheel nut.

DISMANTLE ENGINE - 1 SPEED

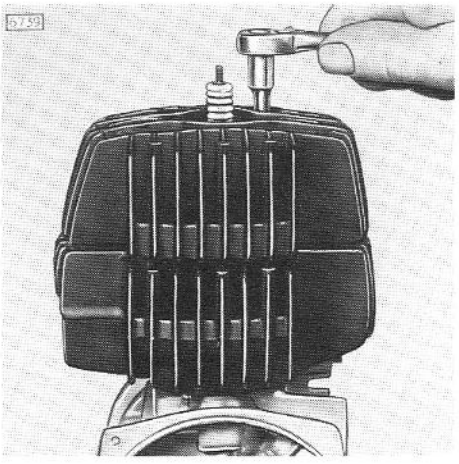
Break taper between flywheel and crankshaft with special puller 050.7012. Remove flywheel and woodruff key from crankshaft.



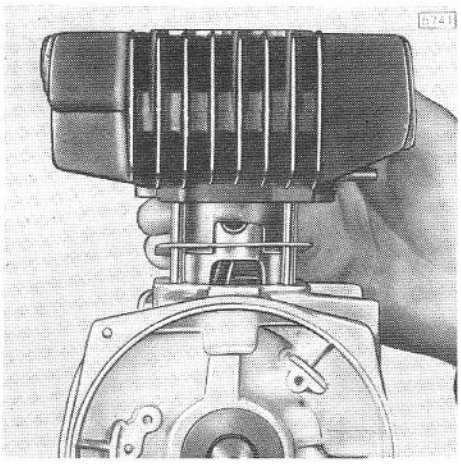
Unscrew the stator plate screws, remove the stator plate assembly and pull out the generator wiring including the rubber grommet.



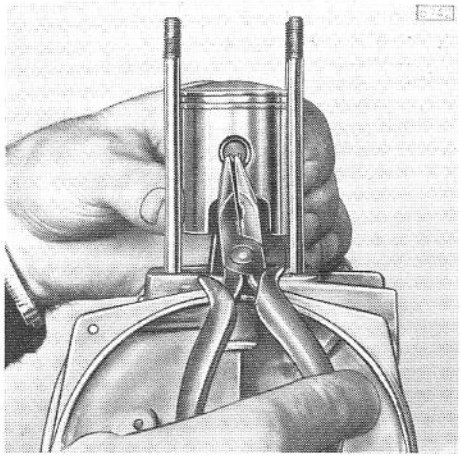
After removing the cylinder head nuts lift off the cylinder head and cylinder head gasket.



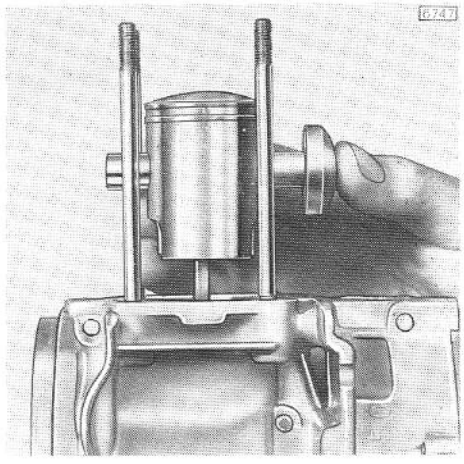
DISMANTLE ENGINE - 1 SPEED



Remove cylinder and base gasket.



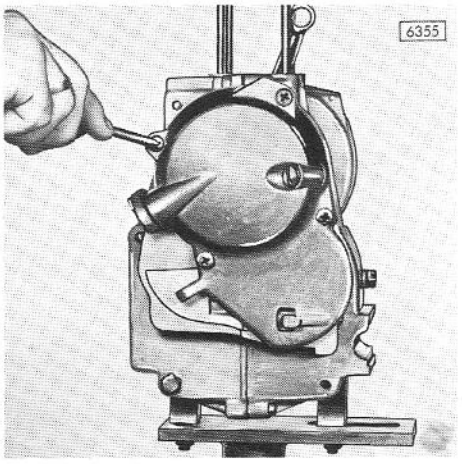
Remove wrist pin retaining rings.



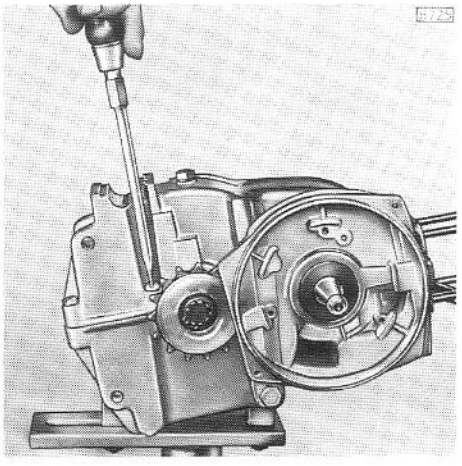
Push out the wrist pin and remove piston.

DISMANTLE ENGINE - 1 SPEED

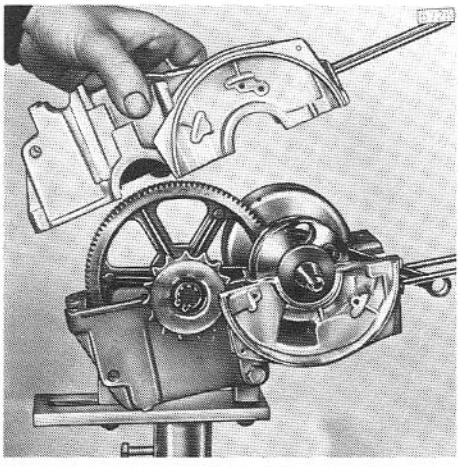
Remove clutch cover screws and clutch cover.



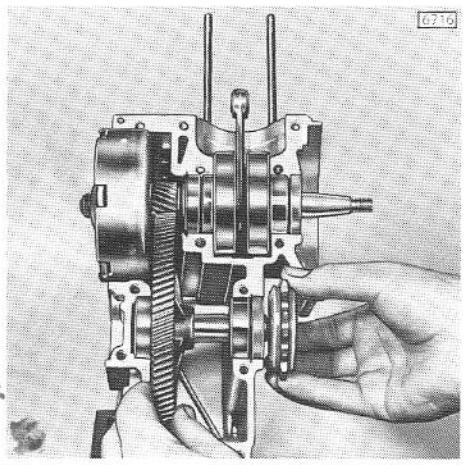
Mount engine in engine stand so that the lower crankcase half is facing upward. Remove all crankcase screws.



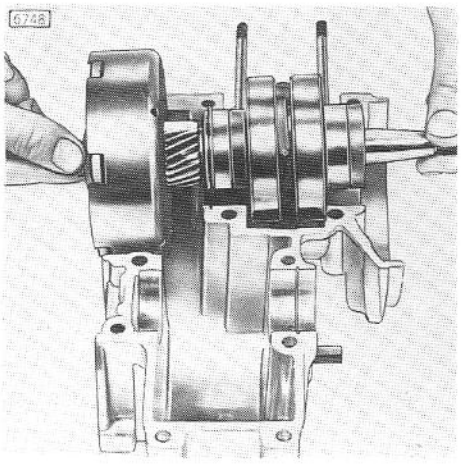
Slightly tap the upper crankcase half with a rubber hammer to break sealant between the two housing halves and remove top half.



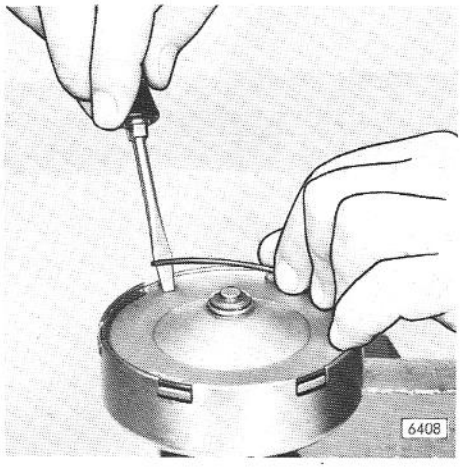
DISMANTLE ENGINE - 1 SPEED



Lift primary drive assembly from lower crankcase half.



Remove crankshaft with clutch assembly.



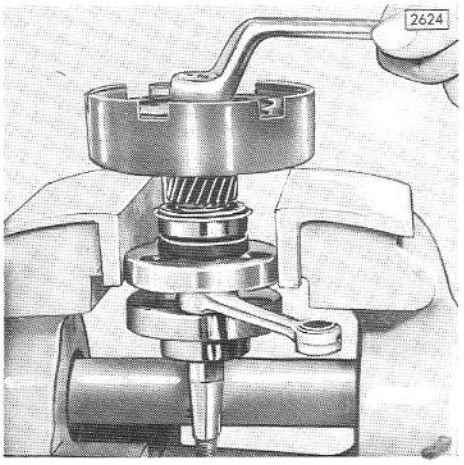
DISMANTLE CRANKSHAFT

Remove large retaining ring from clutch drum and lift off pressure plate.

DISMANTLE ENGINE - 1 SPEED

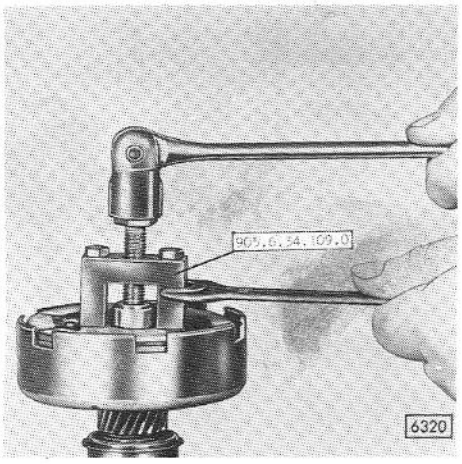
Place crankshaft between soft jaws in a vise, clamping the clutch side web only and remove clutch retainer nut.

⚠ **Ensure to clamp only the clutch side crank web, or damage to crankshaft is unavoidable.**

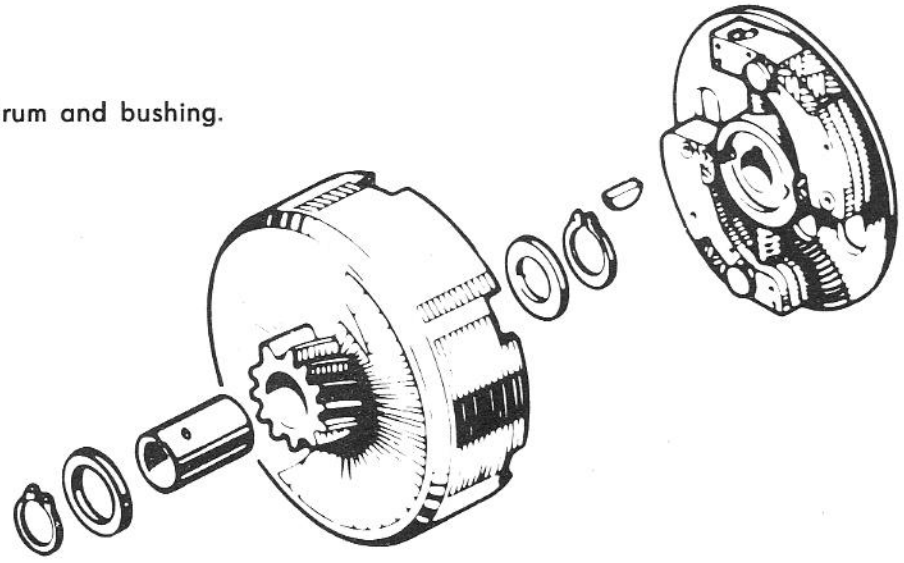


Use special puller 905.6.34.109.0 to remove centrifugal clutch from crankshaft. Remove clutch hub and woodruff key.

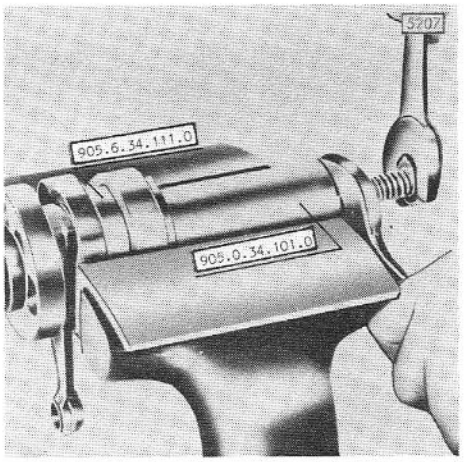
NOTE: Clutch assembly may also be dismantled with engine mounted in moped.



Remove circlip, shims, clutch drum and bushing.

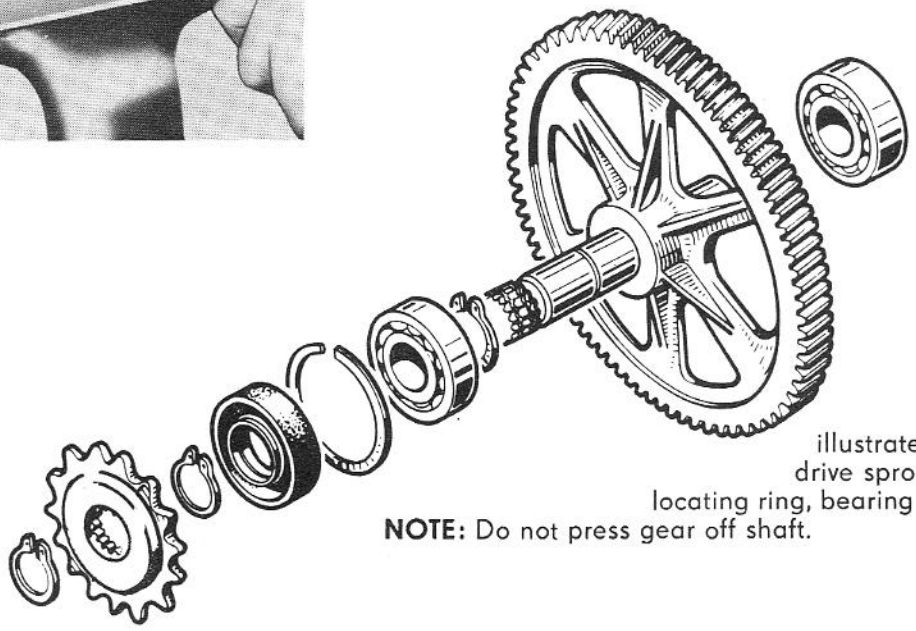


DISMANTLE ENGINE - 1 SPEED



Remove main bearings with puller 905.0.34.101.0 and cages 905.6.34.111.0.

Clamp crankshaft web only on side of which bearing is being removed, or crankshaft damage will occur.



Dismantle the primary drive as illustrated. Remove circlip drive sprocket, circlip, seal, locating ring, bearing and inner circlip.

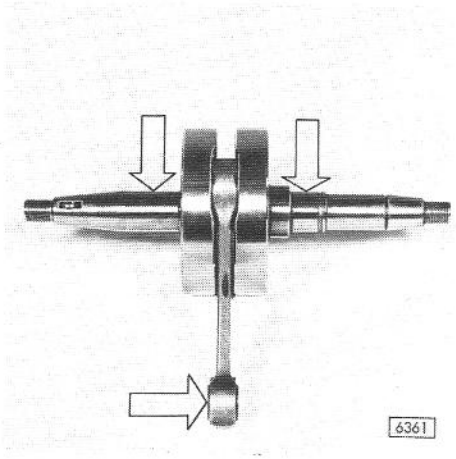
NOTE: Do not press gear off shaft.

Remove all traces of sealing compound from crankcase. Thoroughly clean all parts with degreasing solvent and visually inspect parts for wear and damage.

CHECKING CRANKSHAFT BY SIGHT

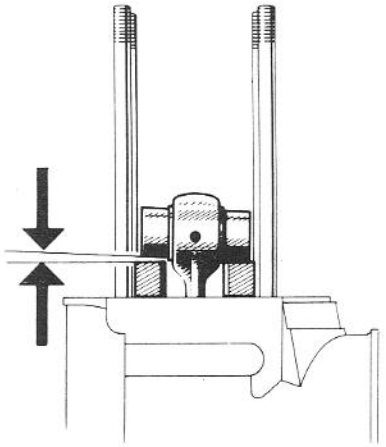
Whenever dismantling or fitting a new crankshaft check bearing seating and seal running areas.
Other repair works to the crankshaft are outlined in the following steps in this manual.

NOTE: The same testing and repair method is being applied for all crankshafts.

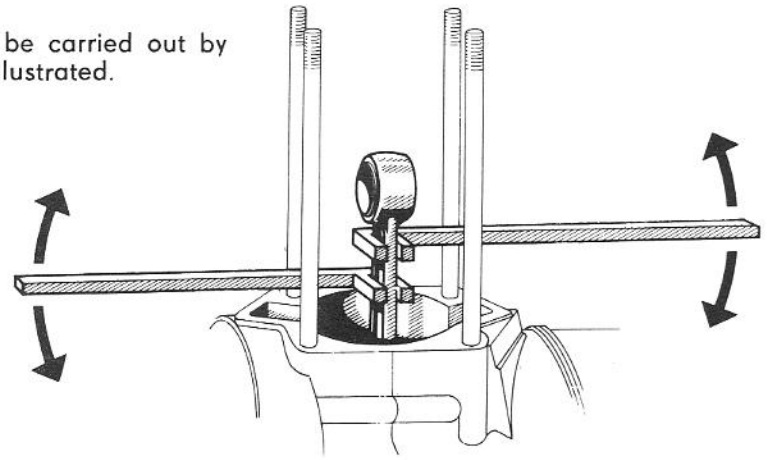


CONNECTING ROD ALIGNMENT

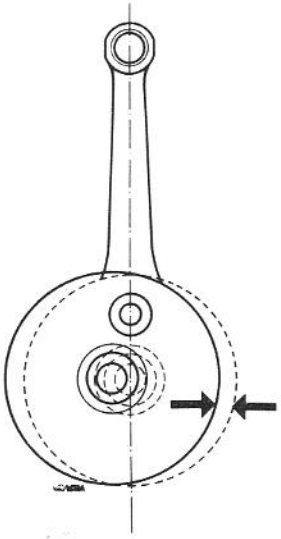
Measuring and straightening can be accomplished if the crankshaft is dismantled or, if still fitted to the engine, after removing the cylinder and piston. With a pair of steel blocks accurately ground to equal height, measure the wrist pin with a feeler gauge as illustrated.



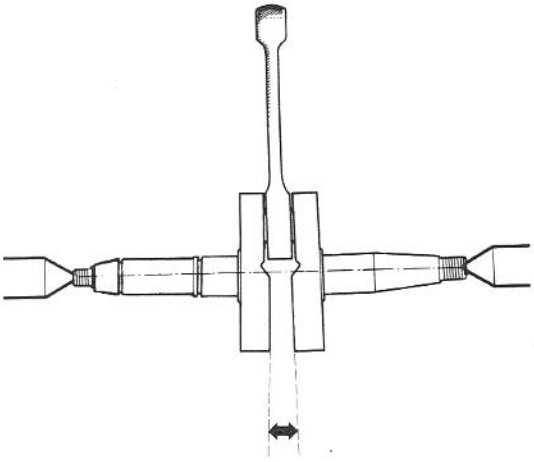
Straightening of the connecting rod can be carried out by means of two (2) home made forks as illustrated.



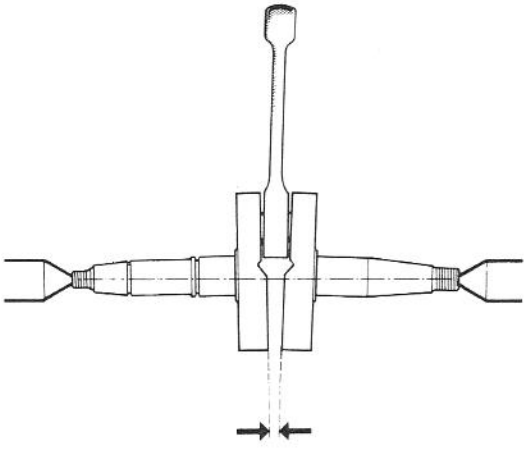
CRANKSHAFT



When completely dismantling the engine the crankshaft should be checked as well.
Three different faults may occur:
1. Crank webs are out of true



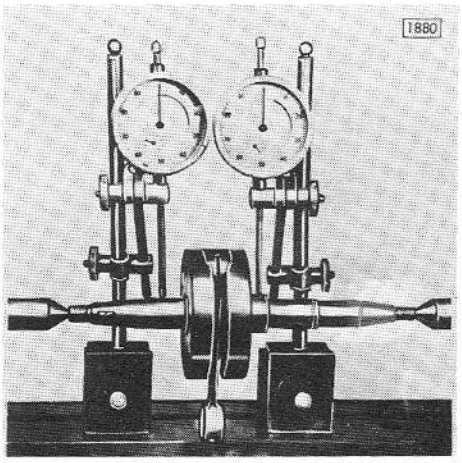
2. Crank journal is bent so that the webs are no longer parallel but oblique (outward).



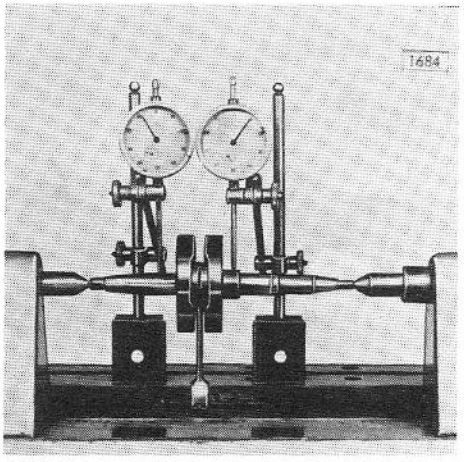
3. Crank journal is bent so that the webs are no longer parallel but oblique (inward).

CRANKSHAFT-TESTING, BALANCING AND CENTERING

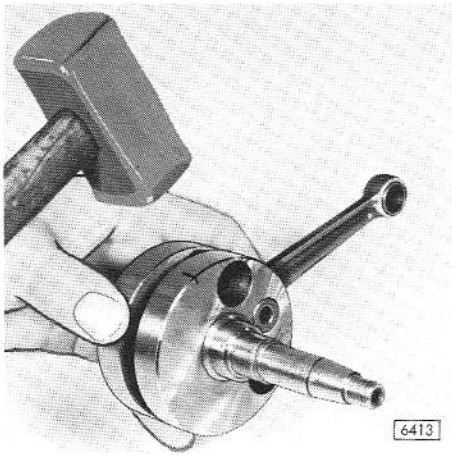
1. Crank webs are out of true:
   With the big-end pointing upwards, clamp crankshaft between two center points. Place two dial indicators on the crankshaft journals close to the crank webs and set the dial indicators to zero.

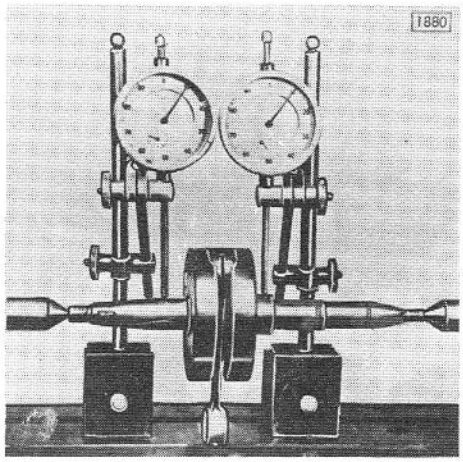


Rotate crankshaft downwards, one dial indicator will register plus, the other minus. Mark the position of the maximum reading on the crankshaft web.

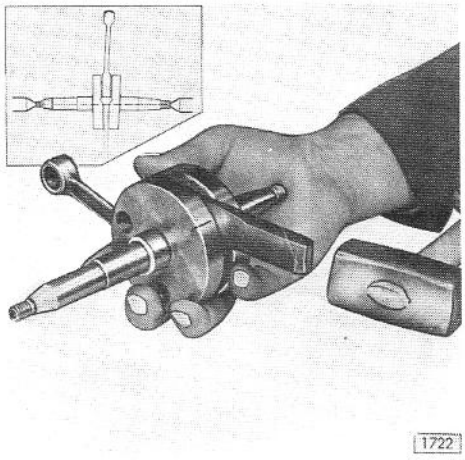


Remove crankshaft from centering points.
Straighten crankshaft by hitting the maximum reading mark with a copper or plastic hammer.
Repeat testing with dial-indicator until the crankshaft is within the permissible tolerance, which is .0008 – .0010 in. (0,020 – 0,025 mm).

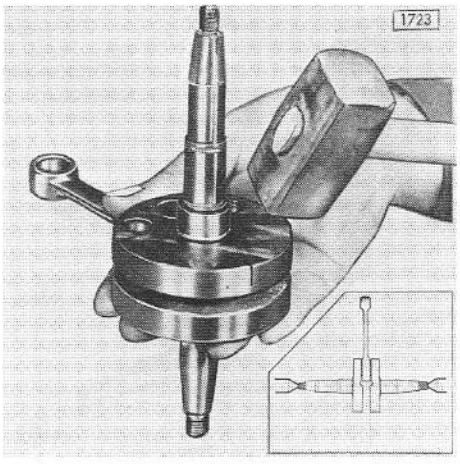




2. Crank webs are not parallel:
Set dial indicators to zero when the big end journal is parallel to the crank journals. Rotate crankshaft with big end journal upwards.
Readings taken are either both plus or both minus.



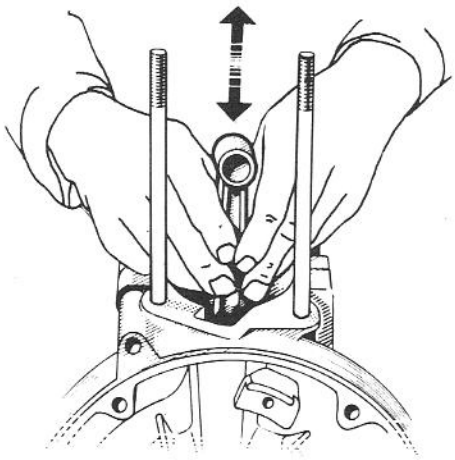
If the readings taken show that the crank webs are bent inwards (plus reading) the crankshaft is straightened by inserting a tapered bar in the narrow (marked) position.



If the crank webs are bent outwards (minus reading) the crankshaft, is straightened by hitting the flat side of the crank web . Repeat the procedure until the out of balance is within the permissible limit, which is .0008 - .0010 in. (0,020 - 0,025 mm)

CRANKSHAFT - WRIST PIN

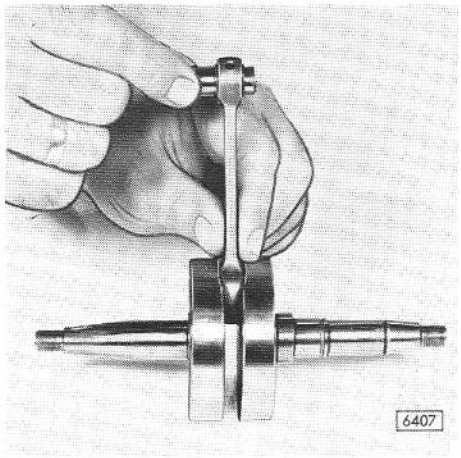
BIG-END BEARING CLEARANCE



If overheating, jamming or wear is apparent, crankshaft assembly must be replaced.

It is very difficult to measure the correct clearance and can only be carried out by the manufacturer. However, a very simple method is by firmly grasping the connecting rod to check for big end bearing wear. If rod is free but no play is noticeable, big end bearing is in good condition.

Before assembling an engine, always check the small end bushing for wear. If excessive wear is noticeable replace small end bushing.



SMALL END BUSHING:

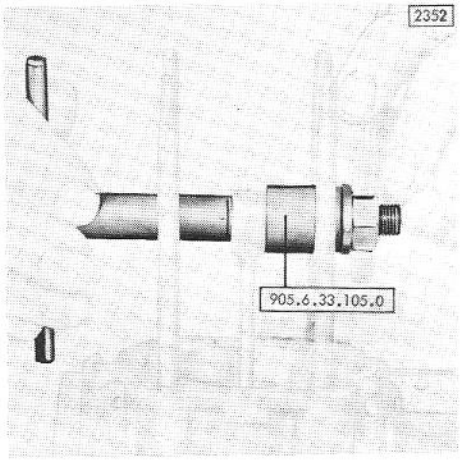
Fitting limits	Wear limit
.473 – .474 in.	.475 in.
12,008 – 12,020 mm	12,025 mm

For correct wrist pin assortment and sizes see assorting table on page 40.

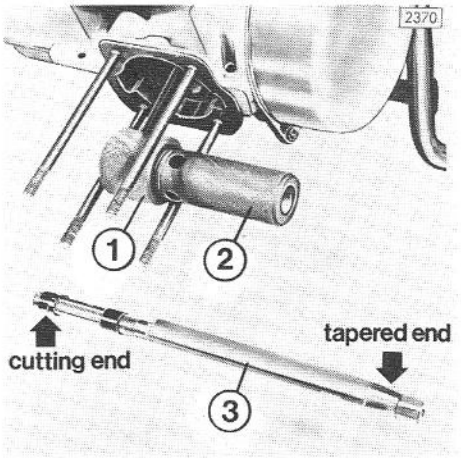
REPLACING SMALL END BUSHING

Use special tool 905.6.33.105.0 to remove and replace bushing.

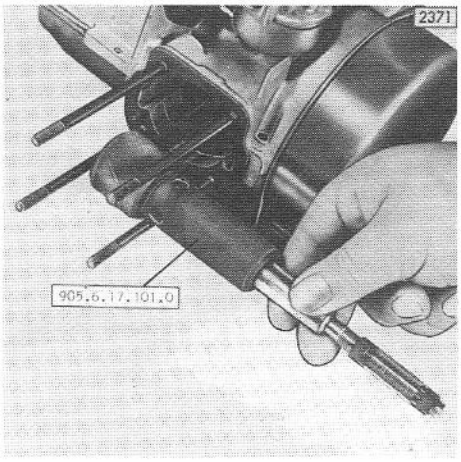
NOTE: Lubrication hole in bushing being installed and connecting rod small-end must be in line. If replacement bushing has no hole, one must be drilled after bushing is in position.



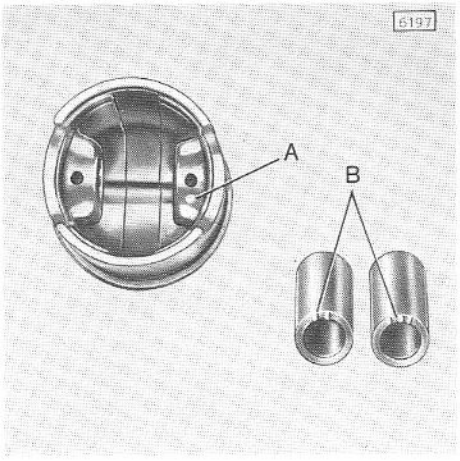
CRANKSHAFT - WRIST PIN



For centralizing and reaming use special tool 905.6.17.101.0
To enable accurate reaming place centralizing nut (1) over little end, insert guide sleeve (2) in centralizing nut.
Insert tapered end of the reamer shaft (3) in guide sleeve and centralize tool over bushing. Tighten guide sleeve to centralizing nut.



Adjust cutting edges of reamer to bushing size, remove from guide sleeve and tighten adjustment nuts on reamer. Applying oil to reamer, insert cutting end of reamer into guide sleeve, start reaming procedure until correct wrist pin bushing clearance is achieved.



Wrist pin and piston fit is matched together and coded as follows:

	Wear limit
yellow or blue dot inside piston	.475 in.
2 or 3 dots on end of wrist pin	12.025 mm

SORTING TABLE

	Wrist pin boss		Wrist pin
Group	Diameter	Group	Diameter
yellow	.4728 - .4727 in.	2	.4726 - .4724 in.
	12.008 - 12.006 mm		12.003 - 12.000 mm
blue	.4727 - .4726 in.	2	.4726 - .4724 in.
	12.006 - 12.003 mm		12.003 - 12.000 mm
		3	.4725 - .4723 in.
			12.000 - 11.997 mm

PISTON - CYLINDER

Piston-cylinder

Piston and cylinder are matched together and marked on the piston crown and on the joint surface of the cylinder top.

ALU-Cylinder and piston:

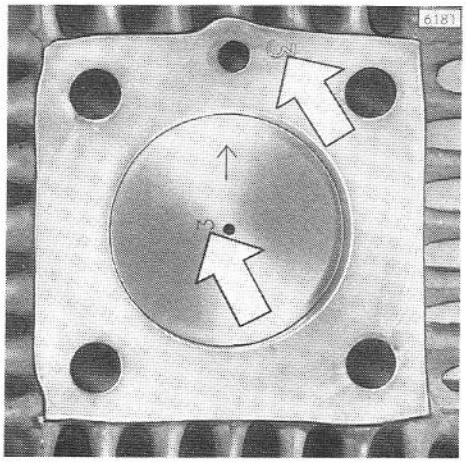
1,2,3,4 or 5 on piston crown
1,2,3,4, or 5 on cylinder head joint surface

Hi-Torque-Cylinder and piston:

11,22 or 33 on piston crown
11,22 or 33 on cylinder head joint surface

MAGNUM-Cylinder and piston:

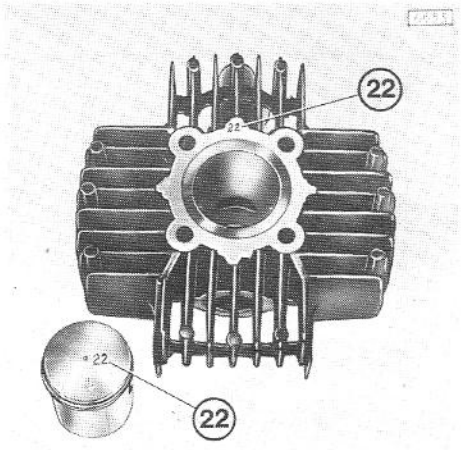
1 or 2 on piston crown
1 or 2 on cylinder head joint surface.



MAGNUM SORTING TABLE

Group	Cylinder Diameter	Piston Diameter
1	1,4961 in. - 1,4964 in. 38,001 mm - 38,008 mm	37,965 mm - 37,975 mm 1,4947 in. - 1,4951 in.
2	1,4964 in. - 1,4967 in. 38,008 mm - 38,016 mm	37,956 mm - 37,965 mm 1,4943 in. - 1,4947 in.

NOTE: The 0/size pistons are available for the Hi-Torque and MAGNUM-Cylinders only. The boring has to be done locally.



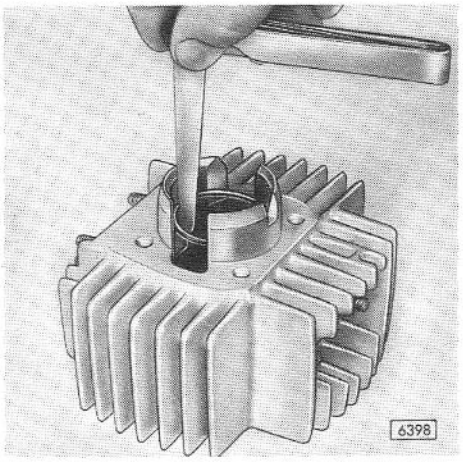
ALU-CYLINDER SORTING TABLE

Group	Cylinder diameter	Piston diameter
1	1.4950 - 1.4954 in. (37.975 - 37.985 mm)	1.4938 - 1.4942 in. (37.945 - 37.955 mm)
2	1.4954 - 1.4958 in. (37.985 - 37.995 mm)	1.4942 - 1.4946 in. (37.955 - 37.965 mm)
3	1.4958 - 1.4962 in. (37.995 - 38.005 mm)	1.4946 - 1.4950 in. (37.965 - 37.975 mm)
4	1.4962 - 1.4966 in. (38.005 - 38.015 mm)	1.4950 - 1.4954 in. (37.975 - 37.985 mm)
5	1.4966 - 1.4970 in. (38.015 - 38.025 mm)	1.4954 - 1.4958 in. (37.985 - 37.995 mm)

HI-TORQUE-CYLINDER SORTING TABLE

Group	Cylinder diameter	Piston diameter
11	1,4960 - 1,4963 in. (38,000 - 38,005 mm)	1,4944 - 1,4946 in. (37,956 - 37,965 mm)
22	1,4963 - 1,4965 in. (38,005 - 38,010 mm)	1,4946 - 1,4949 in. (37,965 - 37,970 mm)
33	1,4965 - 1,4968 in. (38,010 - 38,015 mm)	1,4949 - 1,4951 in. (37,970 - 37,978 mm)

CYLINDER



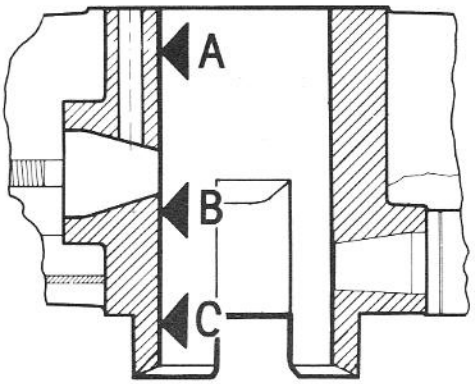
Piston/cylinder clearance limits | **Ring gap**

ALU-Cyl.: Min. .0008 in. (0,020 mm)
Max. .0016 in. (0,040 mm)
Hi-Tor.-Cyl.: Min. .0014 in. (0,037 mm)
Max. .0020 in. (0,052 mm)
MAGNUM-Cyl.: Min. .0014 in. (0.036 mm)
Max. .0020 in. (0,052 mm)

.006 - .012 in.
0,15 - 0,30 mm
(for all models)

NOTE: When boring a cylinder for 0/size piston, note piston sort type number, and refer to respective sorting table and add .25 mm to cylinder sorting (diameter) size.

EXAMPLE: 0/size piston sorting group 22, cylinder diameter required 1.7462 - 1.7464 inches (38,256 - 38,261 mm).

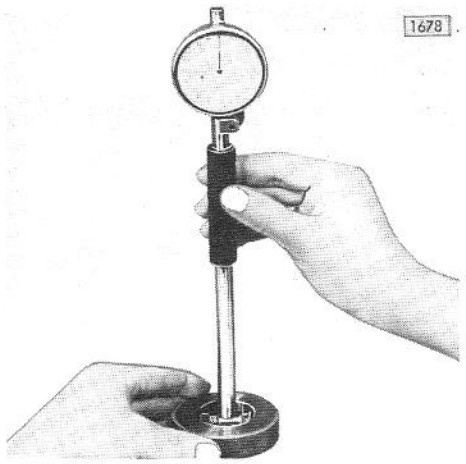


Measuring the cylinder

The cylinder bore is measured with a bore gauge and a bore-measuring adapter (both items are commercially available).

Measuring procedure

Adjust bore gauge by means of the stop measure to the nominal bore diameter.



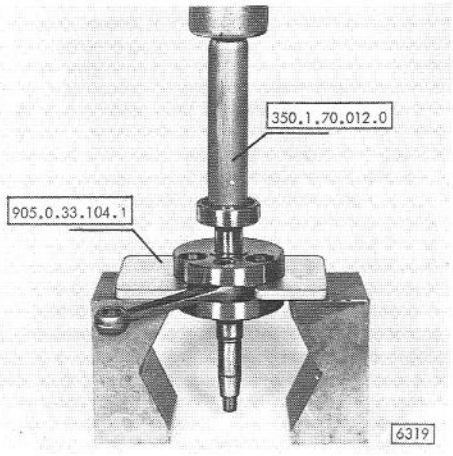
The bore must be measured at six positions, once parallel with and once diametrically opposed the wrist pin at the three positions indicated in fig. The specified temperature of 68° F (20° C) is important if reliable results are to be obtained. The lowest positon of the pointer indicates the bore diameter.

Maximum permissible ovality of cylinders:
ALU-Cylinder .0004 in. (0,01 mm)
HI-Torque-Cyl. .0012 in. (0,03 mm)
MAGNUM-Cyl. .0012 in. (0,03 mm)

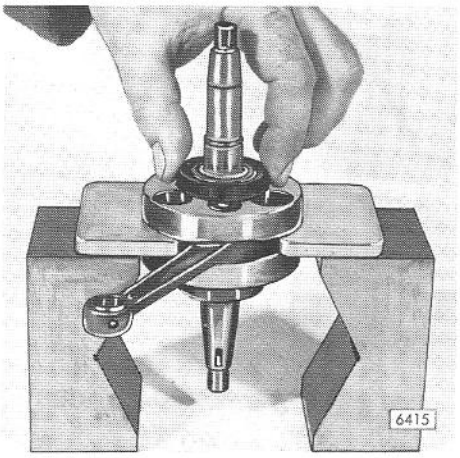
ASSEMBLE CRANKSHAFT - 1 SPEED

ASSEMBLING CRANKSHAFT

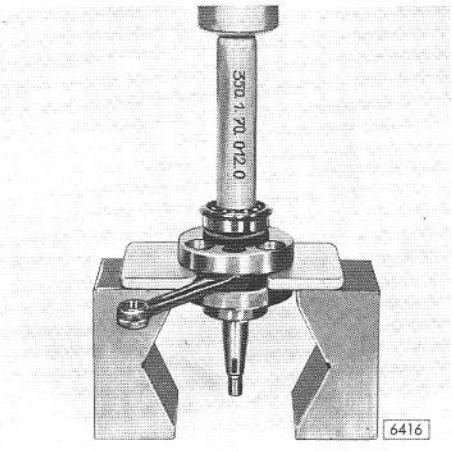
Use special tool 905.0.33.104.1 between the two (2) crankshaft webs and special installation sleeve 350.1.70.012.0 to install flywheel side main bearing on crankshaft.



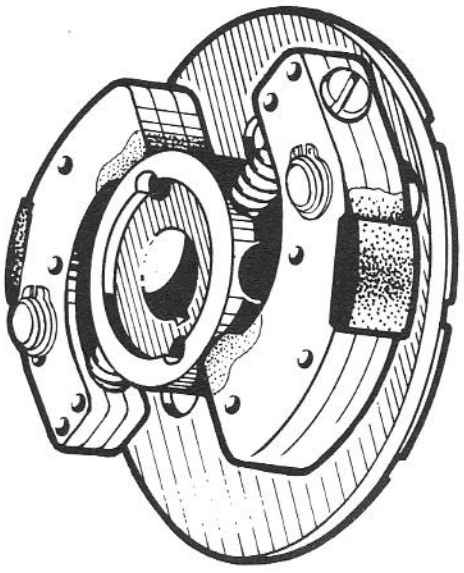
Lubricate oil seal and install crankshaft seal, sealing lips facing outward, on clutch side of crankshaft.



Again use installation sleeve 350.1.70.012.0 to press clutch side main bearing on crankshaft, with the locating ring groove facing the outside.

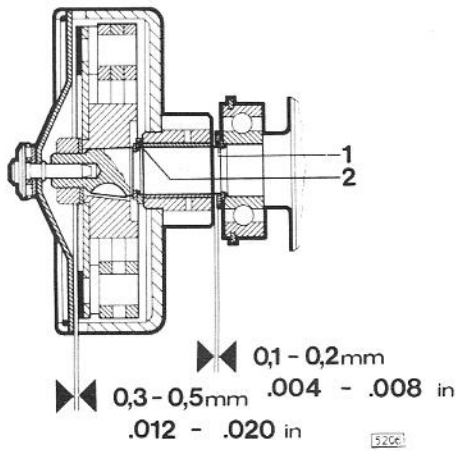


ASSEMBLE CLUTCH - 1 SPEED



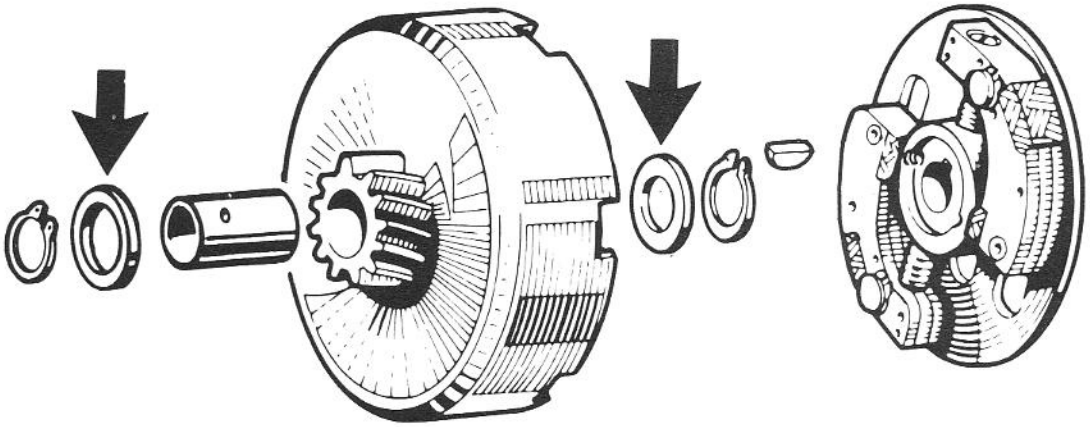
AUTOMATIC (ONE SPEED)

The automatic consists of a centrifugal clutch and a one (1) speed gear train.
Starting engine: engaging the pressure plate with the centrifugal clutch (face lining) will give a solid drive between crankshaft and clutch drum.
Centrifugal clutch starts to open at appr. 1200 - 1500 rpm.
Fully engaged at appr. 2600 - 3000 rpm and is disengaging between 1400 - 1150 rpm.
Centrifugal clutch must be replaced when linings are worn and limit pins (on shoes) prevent drum contact.



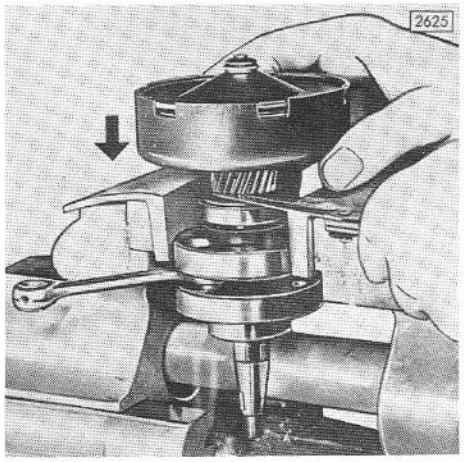
The clearance between pressure plate and face lining of centrifugal clutch should be between .012–.020 in. (0,30–0,50 mm).
The end-float of the clutch drum must be between .004 –.008 in. (0,10 – 0,20 mm). This clearance is achieved by various size of upper and lower shims (1 and 2). The correct adjustment procedure is outlined in the following steps.

Install clutch drum, woodruff key and centrifugal clutch without upper and lower shims (arrows) on crankshaft, torque nut to 20 ft/lb (27 Nm).



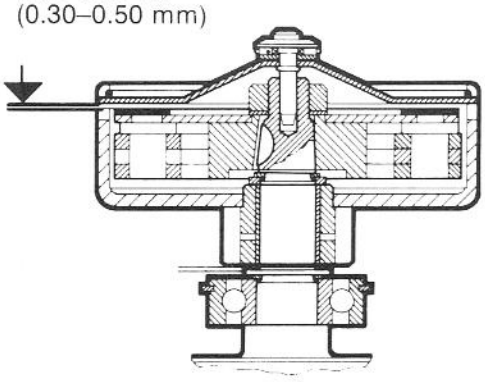
ASSEMBLE CLUTCH - 1 SPEED

First establish the thickness of the lower shim. Press clutch drum down and measure maximum gap between primary gear and circlip on crankshaft with a feeler gauge.



To this measurement add the required clearance of .012–.020 in. (0,30–0,50 mm) between pressure plate and face ling, this would give the required thickness of the lower shim.

.012–.020 in
(0.30–0.50 mm)

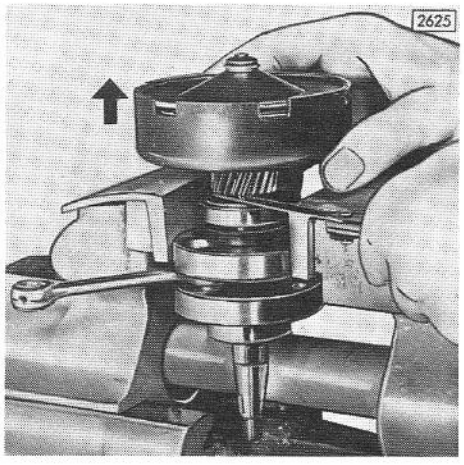


EXAMPLE:	Primary gear/circlip gap	.047 in. (1,20 mm)
	Plus required gap	.012 in. (0,30 mm)
	Lower shim required	.059 in. (1,50 mm)

NOTE: Lower shim .945/.669 in. (24/17 mm) is avaible as follows:

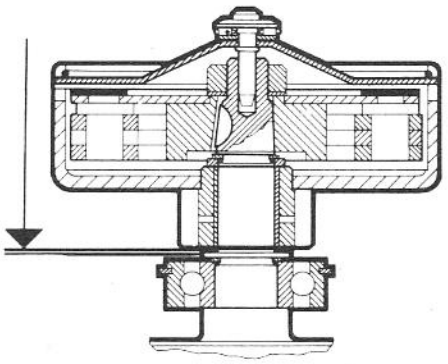
.043 in.	0.51 in.	.059 in.	.067 in.
1,10 mm	1,30 mm	1,50 mm	1,70 mm

Then lift clutch drum and measure the gap between primary gear and circlip on crankshaft (not circlip on bearing). Clutch drum must be shimmed to allow .004 – .008 in. (0,10 – 0,20 mm) end-float.



ASSEMBLE CLUTCH - 1 SPEED

.004–.008 in.
(0.10–0.20 mm)

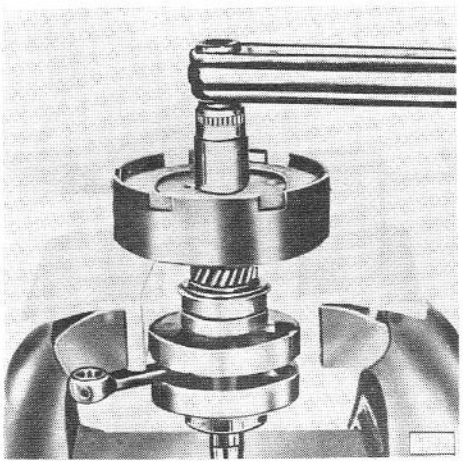


From this measurement deduct lower shim chosen and end-float. This will give required thickness of upper shim.

EXAMPLE:	Primary gear/circlip gap	.142 in. (3,60 mm)
	Less lower shim chosen	.059 in. (1,50 mm)
	Less required end-float	.008 in. (0,20 mm)
	Upper shim required	.075 in. (1,90 mm)

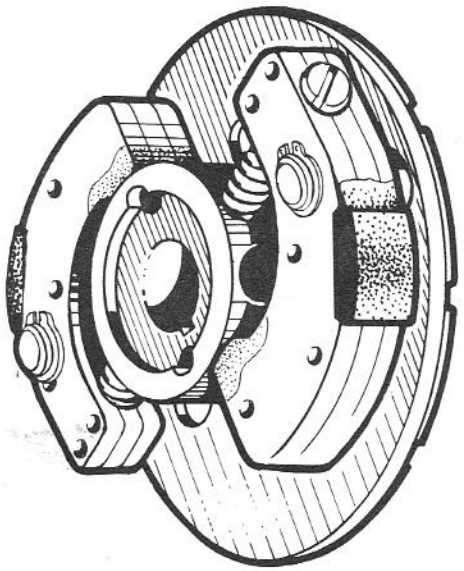
NOTE: Upper shim .866/.591 in. (22/15 mm) is as follows:

.043 in.	.051 in.	.059 in.	.067 in.	.070 in.	.073 in.
.075 in.	,077 in.	.079 in.	.083 in.	.087 in.	
1,10 mm	1,30 mm	1,50 mm	1,70 mm	1,80 mm	1,85 mm
1,90 mm	1,95 mm	2,00 mm	2,10 mm	2,20 mm	



Once the required shims are established, remove clutch assembly and reassemble with shims. Torque nut to 20 ft/lb (27 Nm).

NOTE: Do not forget woodruff key.
Replace pressure plate and secure with large retaining ring.

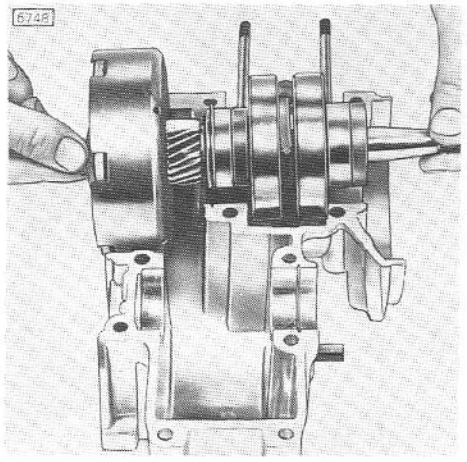


Minimum starter clutch lining (face lining) is .040 in. (1,0 mm).

ASSEMBLE ENGINE - 1 SPEED

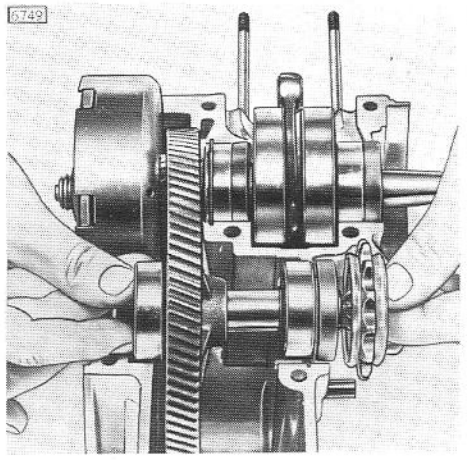
ASSEMBLING ENGINE:

Lubricate magneto side oil seal and install with sealing lip facing inwards.



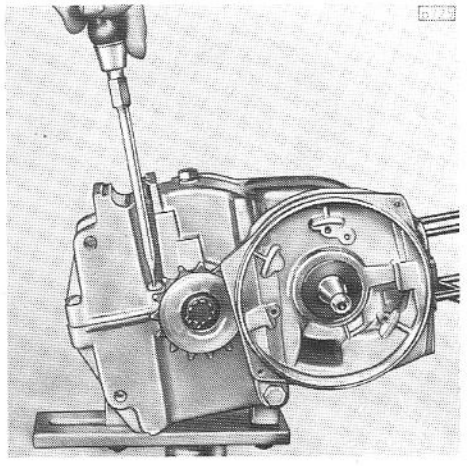
⚠ Ensure sufficient gap between magneto side bearing and oil seal appr. .040 in. (1 mm) to allow oil flow to bearing. Install crankshaft and clutch assembly in housing half.

Reassemble primary drive, lubricate seal and install with sealing lip facing outward. Place assembly in crankcase half.

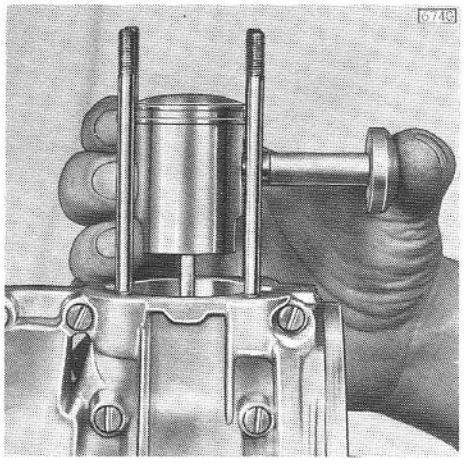


NOTE: Assure that locating rings (on crankshaft clutch side main bearing and primary drive, between bearing and seal) have their gaps face straight up.

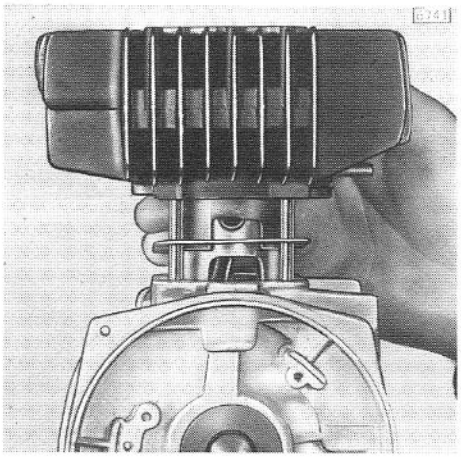
Sparingly apply sealing compound (non-hardening) to crankcase joint, fit crankcase half into place and torque crankcase screws to 6 ft/lb (8 Nm).



ASSEMBLE ENGINE - 1 SPEED



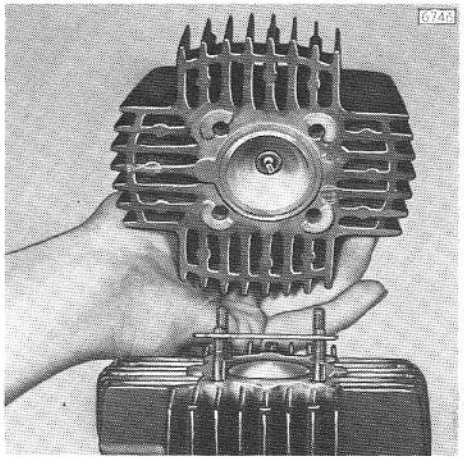
Place engine in upright position, oil small end bushing and install piston. Ensure the arrow on the piston crown and ring locating pins are facing the exhaust (drain plug) side.



Fit a new cylinder base gasket into place, lightly oil piston and cylinder wall and replace cylinder.

⚠ **Be sure to align ring gap to their respective locating pins.**

NOTE: The exhaust port of the cylinder should face drain plug side of engine.

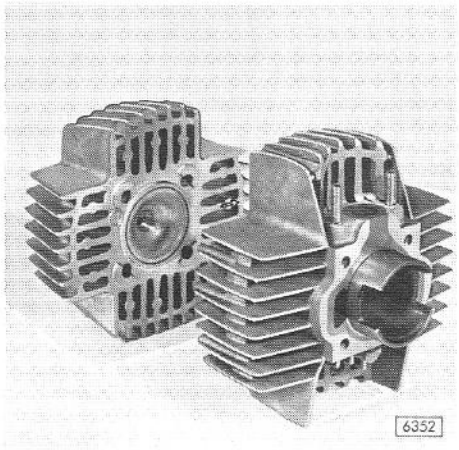


Place proper size cylinder head gasket, where applicable, into position. Fit head and washers and torque cylinder head nuts to 7ft/lb (10 Nm).

CYLINDER HEAD GASKET SORTING TABLE

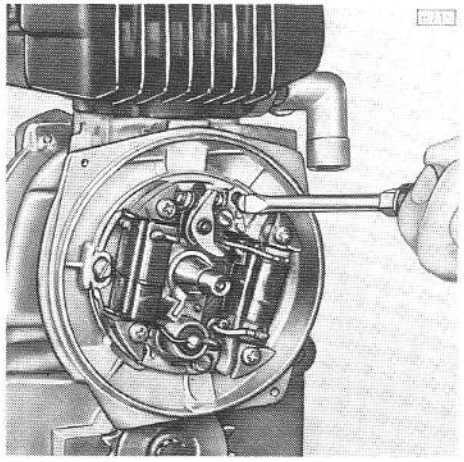
MODELS						
HP	MAXI	MAXI-LUXE	NEWPORT II	MAXI SPORT MK II	MAGNUM II	MAGNUM MK II
1	.060 in. (1,50 mm)	.060 in. (1,50 mm)	.016 in. (0,40 mm)	.016 in. (0,40 mm)	.016 in. (0,40 mm)	.016 in. (0,40 mm)
1,5	.016 in. (0,40 mm)	.060 in. (1,50 mm)	.060 in. (1,50 mm)	.060 in. (1,50 mm)	.075 in. (1,90 mm)	.075 in. (1,90 mm)
2	.016 in. (0,40 mm)	.031 in. (0,80 mm)	None	None	.016 in. (0,40 mm)	.016 in. (0,40 mm)

No cylinder head gasket is used on the NEWPORT II and MAXI SPORT MK II 2 HP HI-Torque cylinder heads. Ensure that both joining surfaces are clean and sealing groove in head is absolutely free from damage.

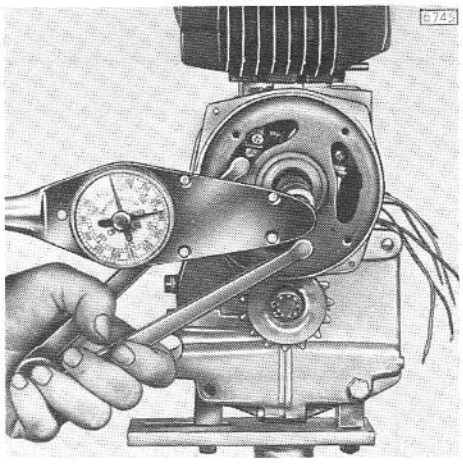


Inspect contact breaker points for burning, pitting or wear and replace if necessary. Inspect coils and wires for cuts and loose connections.
Feed magneto wires through crankcase opening and replace rubber grommet. Install generator stator plate assembly so that the locating screws are in the center of the locating holes.

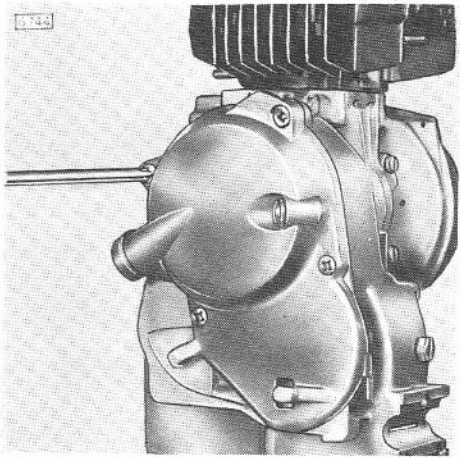
NOTE: Ensure no wires are squeezed between stator plate assembly and housing.



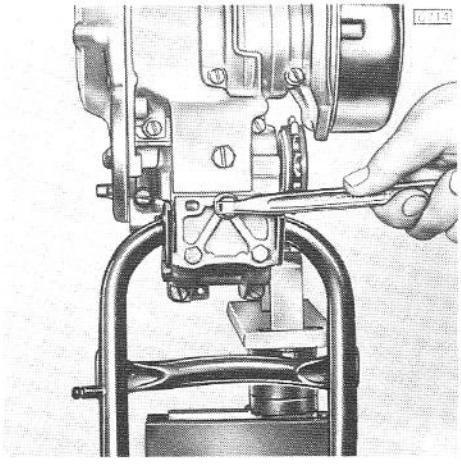
ASSEMBLE ENGINE - 1 SPEED



Clean crankshaft taper, fit woodruff key into keyway, install flywheel. Use locking device 905.0.16.101.2 to lock flywheel and torque nut to 25 ft/lb (35 Nm). Before replacing generator cover set ignition timing (see page 110).



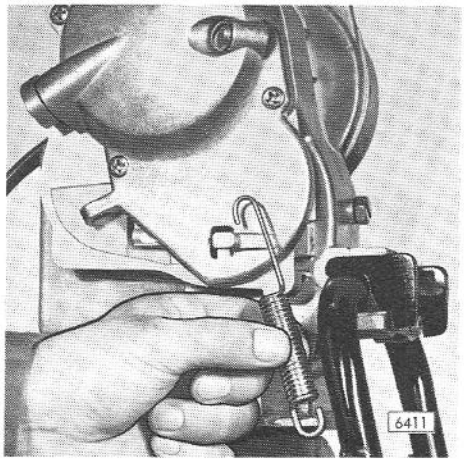
Install a new gasket and replace clutch cover. Torque screws to 6 ft/lb (8 Nm).



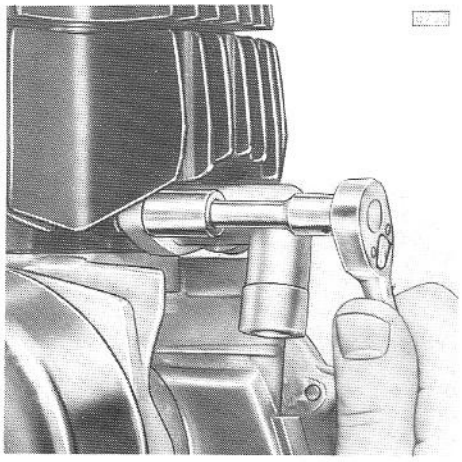
Replace kickstand. Torque bearing shell retaining bolts to 6 ft/lb (8 Nm).

ASSEMBLE ENGINE - 1 SPEED

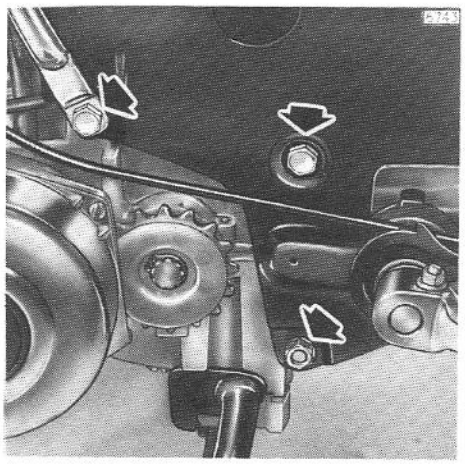
Fit kickstand return spring.



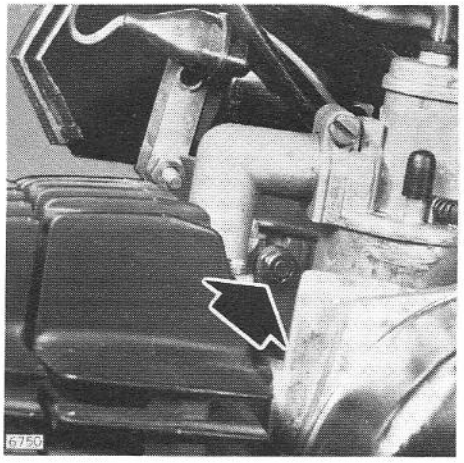
Fit new gasket and intake manifold.



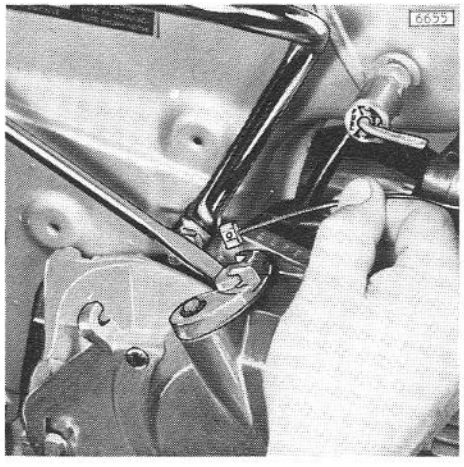
INSTALL ENGINE - 1 SPEED



Place engine in frame and torque engine mounting bolts to 23 ft/lb (32 Nm).



Replace ignition coil.

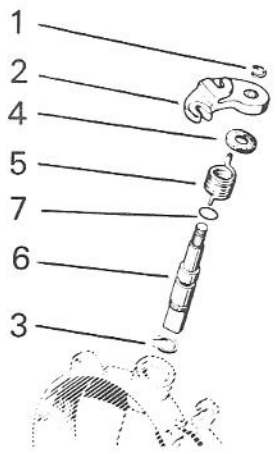


Fit starter cable.

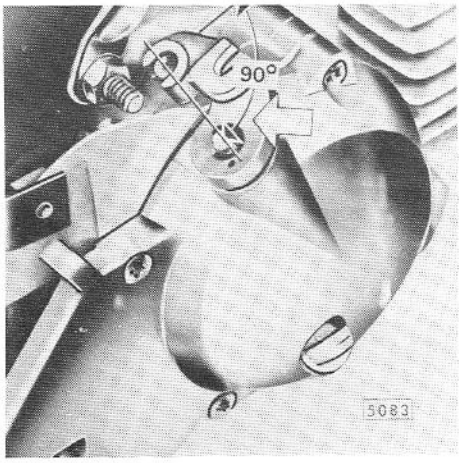
INSTALL ENGINE - 1 SPEED

CLUTCH LEVER AND SHAFT

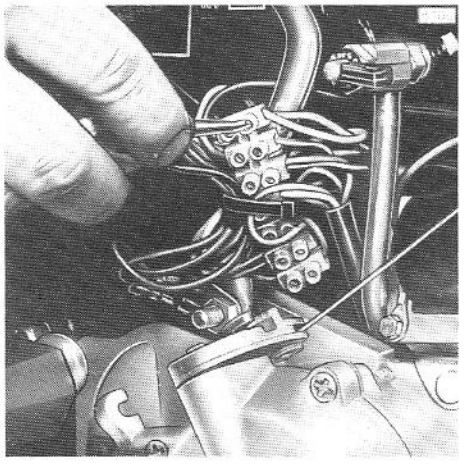
Drain transmission fluid, remove kickstand spring, and clutch cover. Remove upper circlip (1), clutch lever (2), lower circlip (3), seal ring (4) and spring (5). After removing the clutch shaft (6) check housing and shaft for excessive wear. Always replace „0" ring (7) and seal ring (4).



Use reverse procedure on re-assembling the shaft. When fitting the starter lever ensure the lever is installed correctly. Before the starter clutch engages fully, the lever should form a right angle with the starter cable.

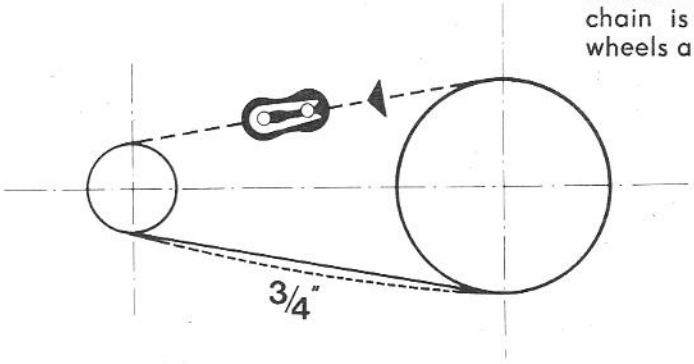


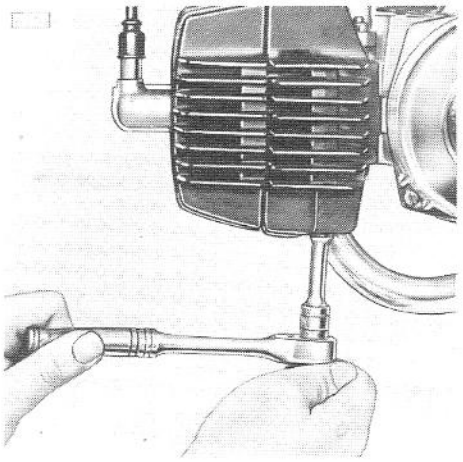
Reconnect electrical wires at junction block. Match color codes.



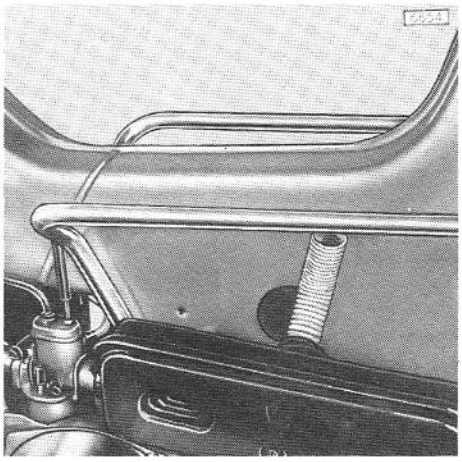
INSTALL ENGINE - 1 SPEED

Install drive chain, take care that the tension is correct and the connecting link is properly placed with the closed end pointing in the direction of chain travel. The proper slack of the drive chain is 3/4 in. (2 cm). To adjust tension, loosen axle nuts and tighten or loosen rear adjuster nuts. Once the drive-chain is properly adjusted, tighten axle nuts. Make sure wheels are in alignment (for further information see page 97).





Fit a new exhaust gasket and replace exhaust system.



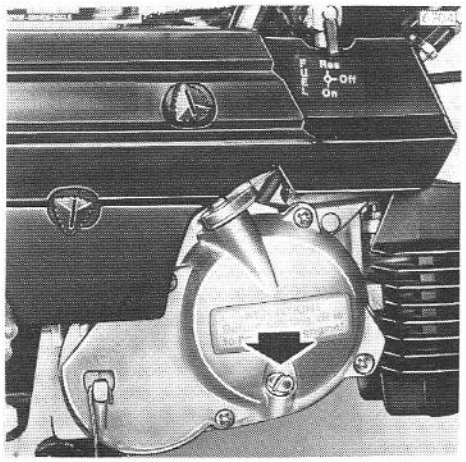
Replace carburetor, install fuel supply hose and fit air filter assembly.

Do not push intake hose too deeply into filter assembly as this could cause air flow restriction.

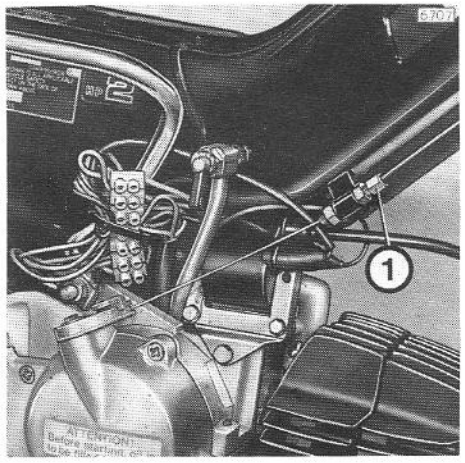
INSTALL ENGINE - 1 SPEED

Remove filler plug and fill transmission with Automatic Transmission fuid "Type F" 5¾ fl. oz. (170 cc), until fluid is level with filler hole.

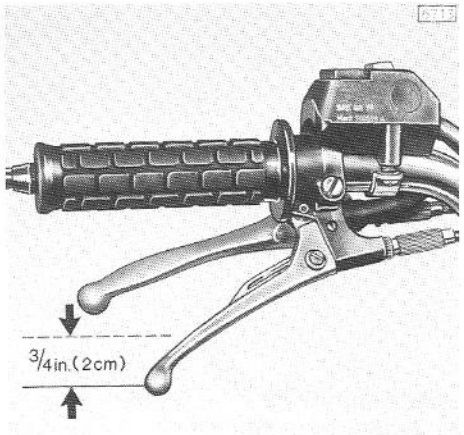
Use only "Type F" Transmission fluid. Other types of fluid may dissolve clutch friction material.



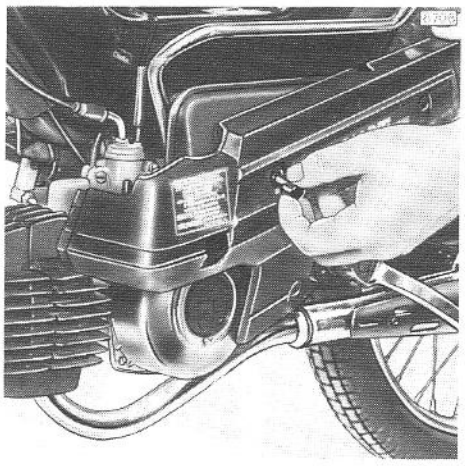
Adjust starter cable with adjusting screw (1).



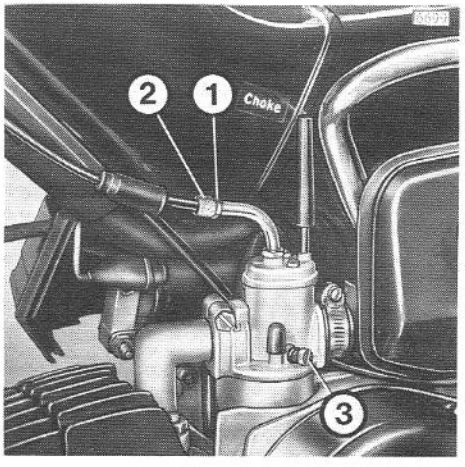
Free play at the starter lever (measured at the end of the lever) should be ¾ in. (2cm).



INSTALL ENGINE - 1 SPEED



Fit both left and right chain guards.

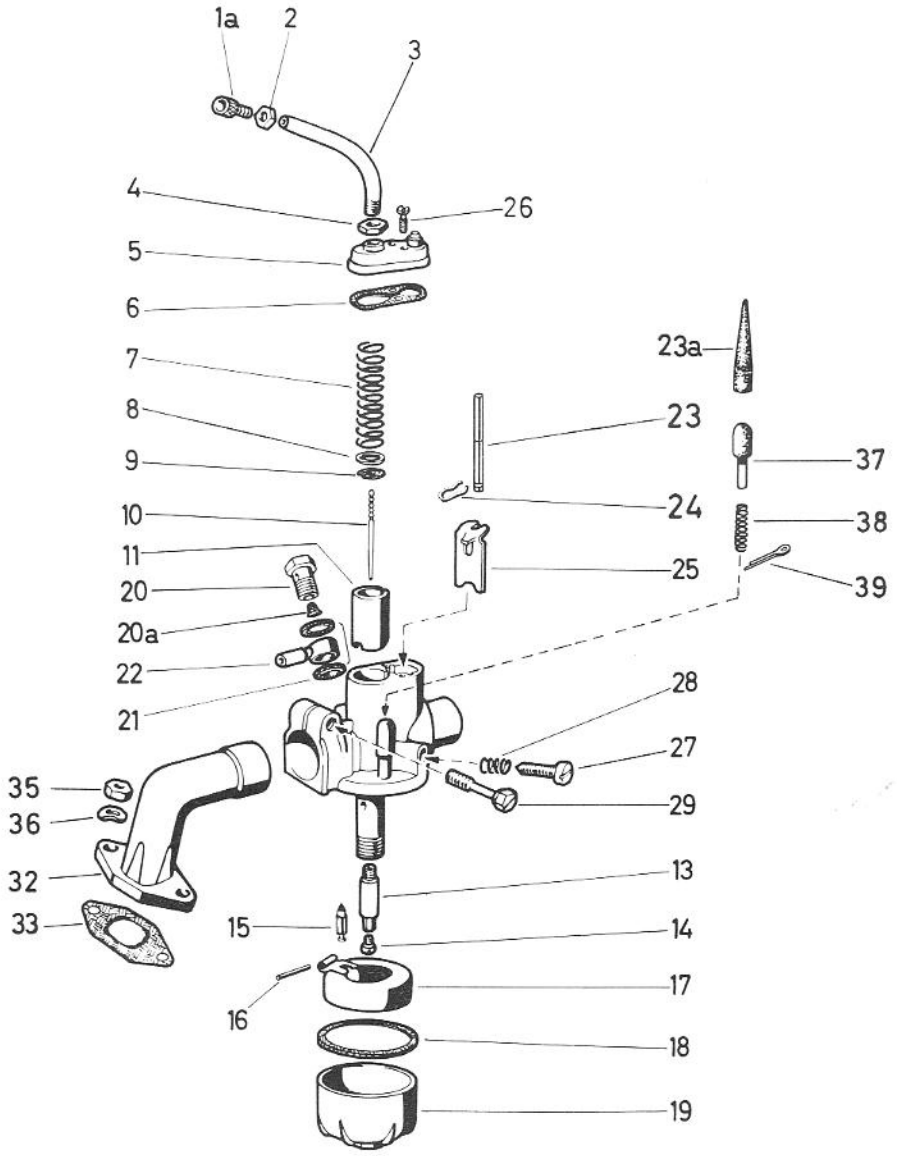


Adjust idle speed and throttle cable:

Start engine and run at moderate speed until operating temperature is reached. Adjust idle speed between 800 – 1200 rpm. Adjust throttle cable slack to .040 in. (1 mm) on adjusting screw (2) and tighten lock nut (1).

CARBURETOR

The carburetor fitted to the engine is tuned to specifications established by intensive factory research and should not be altered in any way. Whenever dismantling a carburetor, clean all components with gasoline and blow off with compressed air. Ensure that the seating of the inlet needle is correct.



CARBURETOR OPERATION TROUBLE SHOOTING TIPS

(The numbers quoted in the brackets on page 58 refer to the above illustration).
The carburetor on your MOPED is a Bing variable venturi (slide type) carburetor. The term variable venturi comes from the fact that the slide varies the amount of the restriction of air through the throat of the carburetor.

CARBURETOR

The components in the carburetor are simple. The slide (ref. no. 11) is attached to a cable which is operated by the twist grip on the handlebar. Turning the twist grip either raises or lowers the slide and this in turn either increases or decreases the amount of air allowed to flow through the throat of the carburetor.

Protruding from the bottom of the slide is a tapered rod or "needle" (ref. no. 10). Its position in relation to the slide is determined by a small clip (re. no. 9) which is inserted in one of four grooves at the top of the needle. This clip then rests on the inside of the bottom of the slide.

Underneath the slide in the body of the caburetor is a brass tube with a carefully selected inside diameter. This tube is called a "needle jet" (ref. no. 13)). The needle hanging out of the slide hangs down into this needle jet.

Threaded into the bottom of the needle jet is a small brass plug called the "main jet" (ref. no. 14). The main jet has a precisely drilled passage and is available in various sizes.

At the bottom of the carburetor is a removable aluminum fuel reservoir called the "float bowl" (ref. no. 19). The float bowl threads onto the base of the carburetor body. Inside the float bowl is a buoyant ring which is called the "float" (ref. no. 17). There is a small brass arm attached to the float on one end and pinned to the carburetor on the other by the float pin (ref. no. 16). Underneath this arm is a steel "inlet needle" (ref. no. 15) which is inserted into a "needle seat" in the carburetor body.

The method of operation of the carburetor is as follows:

1. When the float bowl is empty and the fuel valve on the fuel tank is opened, fuel flows through the fuel line and into the carburetor through the inlet banjo (ref. no. 20–22) and the filter screen (ref. no. 20 a) to the top of the inlet needle. Because the float bowl is empty, the float is hanging down and the needle is off its seat allowing fuel to enter the bowl. As the bowl fills, the float rises to a predetermined level at which point the needle presses against its seat and the flow of the fuel is stopped. As fuel is consumed by the engine the float goes up and down to maintain a constant level of fuel in the float bowl.
2. In order to start a cold engine a very rich fuel air mixtures is required. (A rich mixture would be 1 part of fuel to 5 parts of air or 5 : 1). This can be accomplished by either increasing the amount of fuel or decreasing the amount of air. In the Bing carburetor there is a choke plate (ref. no. 25) which when pushed down cuts off most of the airflow through the throat of the carburetor and thus creates a very rich mixture.

When the engine starts and the throttle is opened, the slide pushes the choke plate up out of the carburetor throat removing the restriction.

3. Since the airflow at each throttle opening position is always constant, a means must be provided to obtain the proper amount of fuel for the mixture. (The running mixtures is 1 part of fuel to 50 parts of air or 50 : 1). From idle to approximately 3/4 throttle the fuel supply is determined by the needle jet. If the fuel mitxure is too lean (not enough fuel) the clip on the needle should be lowered one notch in order to raise the needle further out of the needle jet. This will result in more fuel being discharged at each throttle open position from idle to 3/4 throttle.

   If the fuel mixture is too rich (too much fuel) the clip on the needle should be raised one notch in order to lower the needle into the needle jet. This will result in less fuel being discharged at each throttle open position from idle to 3/4 throttle.

   From 3/4 to full throttle the fuel supply is determined by the size of the main jet. A larger main jet will richen then mixture from 3/4 to full throttle and a smaller main jet will lean the mixture in the same range.

   Needle setting and size of main jet are fixed at the factory and must not be changed.

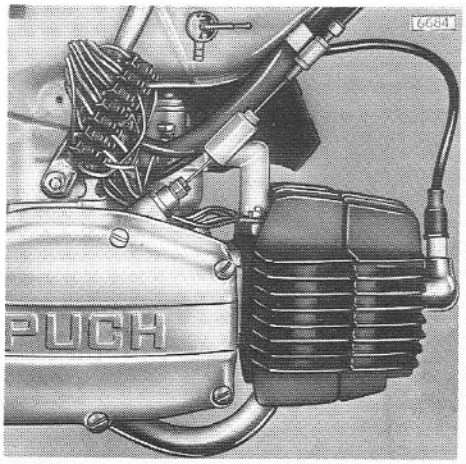
4. The setting of the float can also have an effect on the mixture. If the float is too far from the bottom of the carburetor when the needle closes the fuel reserve will be limited and the engine could run lean. If the float is too close to the carburetor body when needle closes, the engine could run too rich and /or the carburetor could flood.

   To properly set the float level remove the float bowl and invert the carburetor. The float is properly adjusted when the top edge of the float is parallel with the gasket surface of the float bowl on the carburetor body. This setting is very important and should always be checked when mixture problems are encountered.

DISMANTLE ENGINE - 2 SPEED

REMOVE ENGINE

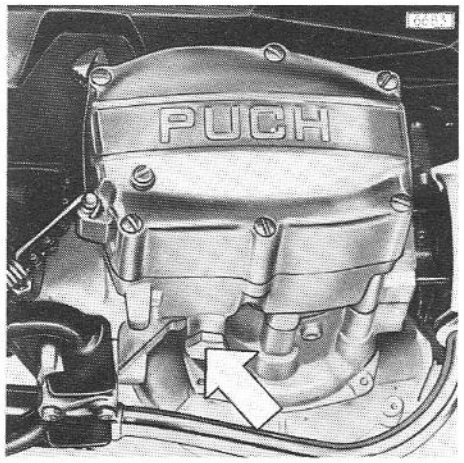
Disconnect starter cable on starter lever, then follow the same procedure to remove the engine as previously outlined. To remove starter cable lift cover on cable, hold adjusting sleeve on engine and unscrew cable-end.



⚠ **(If engine removed, but not completely dismantled). Do not turn adjusting sleeve on engine as this would alter clearance adjustment on starter plate.**

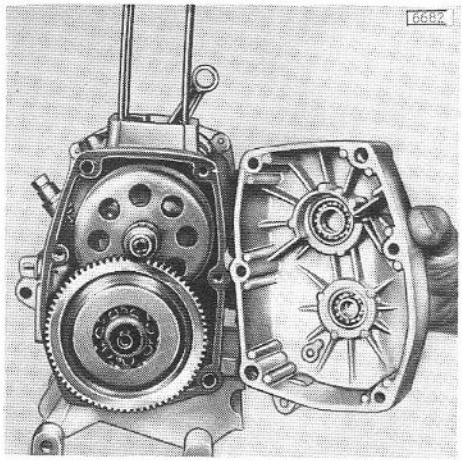
Drain transmission oil.

NOTE: MAGNUM MK II, disconnect oil supply line from oil pump and block-off supply line to avoid oil drainage from oil tank.

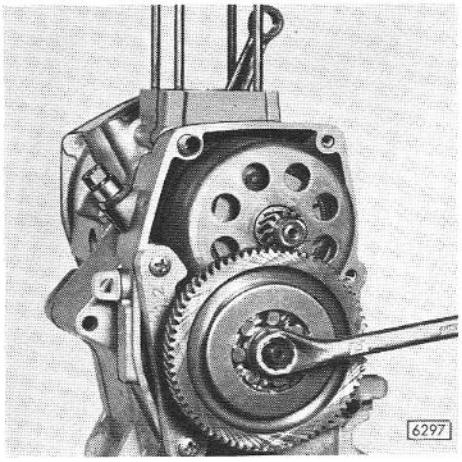


DISMANTLE ENGINE

Follow the same dismantling procedures as outlined on previous pages. Remove clutch cover, gasket, locating sleeves, main shaft and clutch drum shims and roller retainer thrust plate on main shaft. Inspect bearings inside clutch cover. To remove bearings, use special puller no. 905.0.14.002.0, 905.0.14.017.0 and 905.0.14.006.0, if not available, heat cover to appr. 170° F (80° C) and tap cover on workbench.



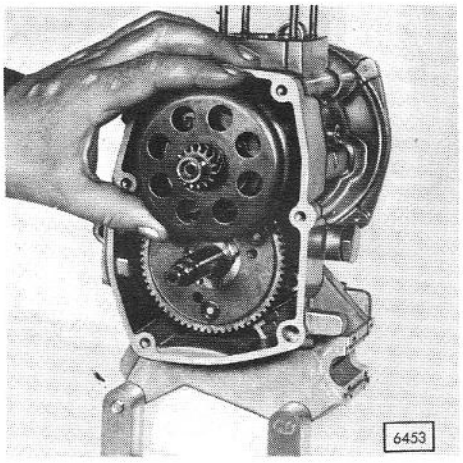
DISMANTLE ENGINE - 2 SPEED



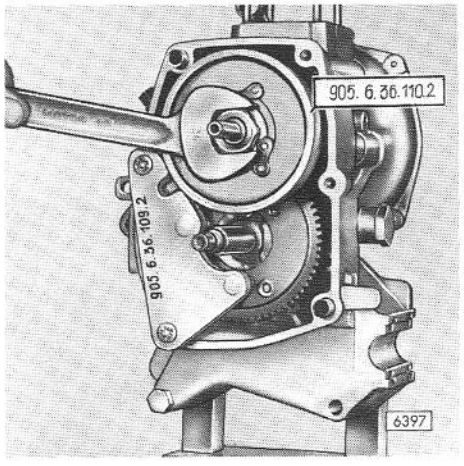
Lock second gear main shaft with tool 905.6.36.109.2 and remove retaining nut on main shaft.

Left hand thread.

NOTE: By loosening retainer nut and spinning first speed gear, the nut and roller pack will remove as a unit.



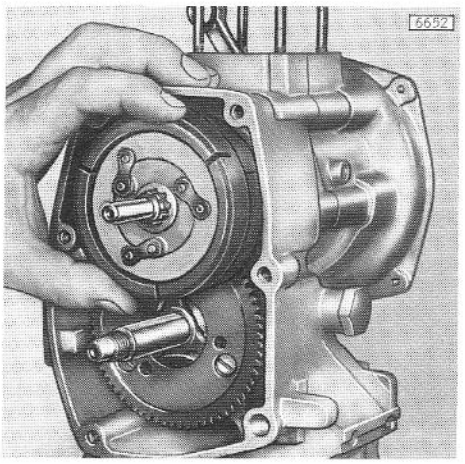
Remove clutch drum.



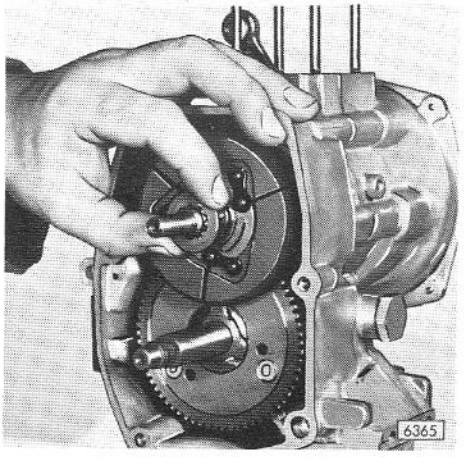
Open lock washer, place locking device 905.6.36.110.2 over centrifugal clutch and interlock with tool 905.6.36.109.2 and remove retainer nut.

DISMANTLE ENGINE - 2 SPEED

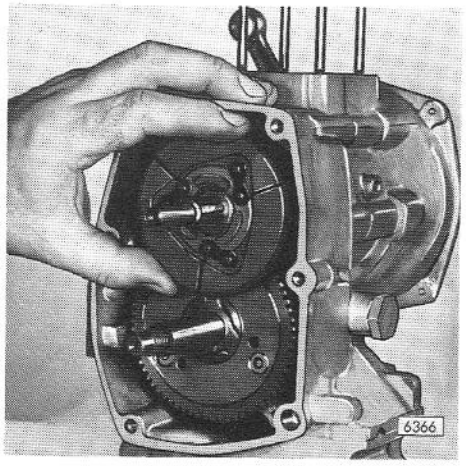
Remove first speed centrifugal clutch.



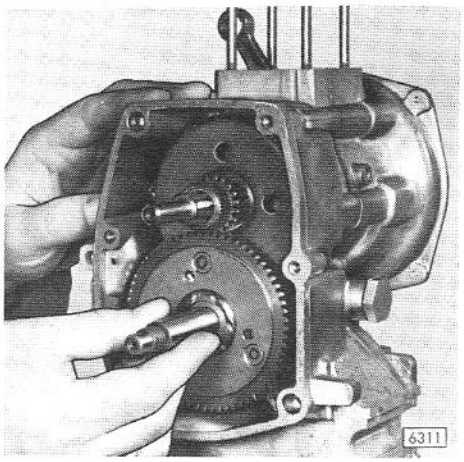
Remove clutch spacer.



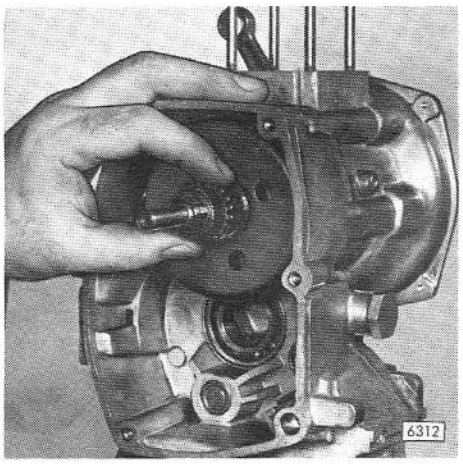
Lift off second speed centrifugal clutch.



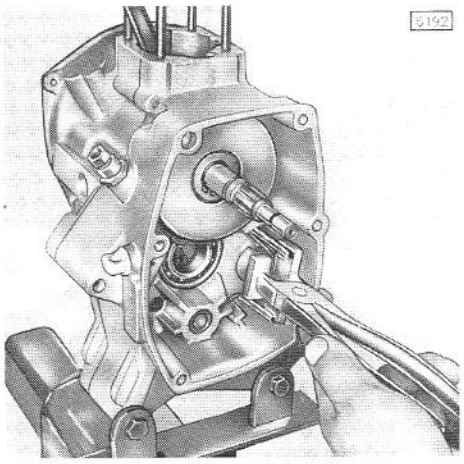
DISMANTLE ENGINE - 2 SPEED



Remove main shaft



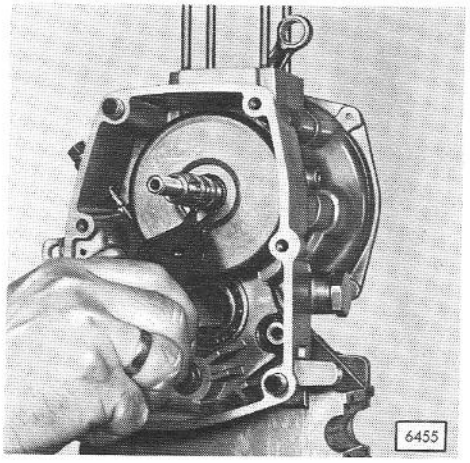
and second speed-driving plate.



With special pliers 905.6.41.101.2 remove retainer spring.

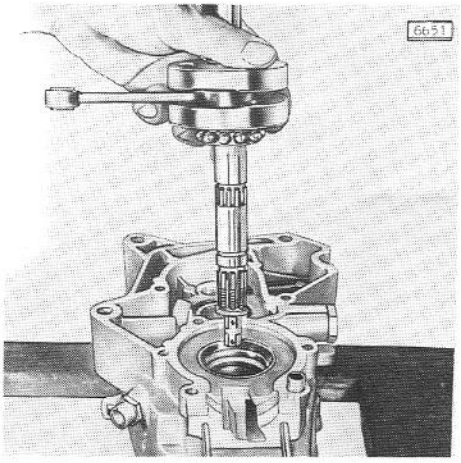
DISMANTLE ENGINE - 2 SPEED

Remove circlip, washer, spring and starter plate from crankshaft. Remove clutch adjusting nut, short starting cable and engaging plate.

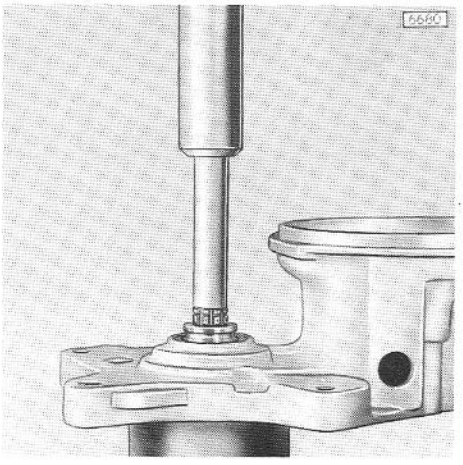


Place engine on assembly table 905.0.31.101.2 and unscrew all housing screws.
Separate housing halves.
Lift crankshaft from lower crankcase half. Remove gasket and both housing dowels!

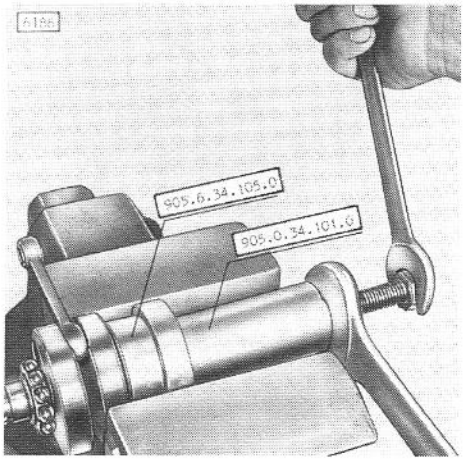
NOTE: During engine overhaul it is important to replace all seals.



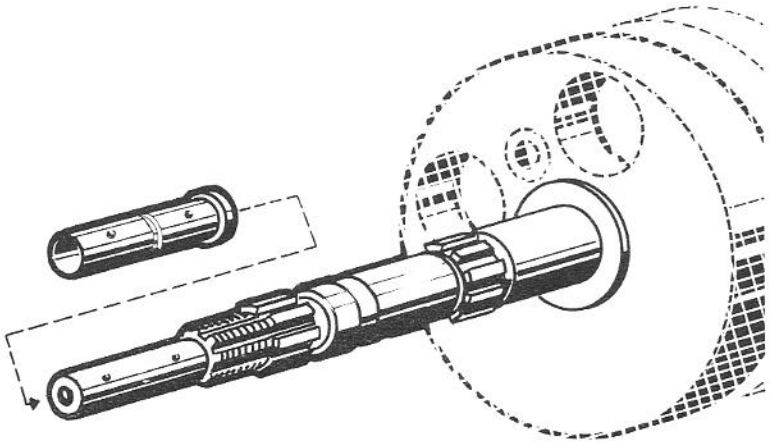
Press out drive shaft from left hand housing half and remove seal. If bearing needs replacement, remove circlip and bearing.

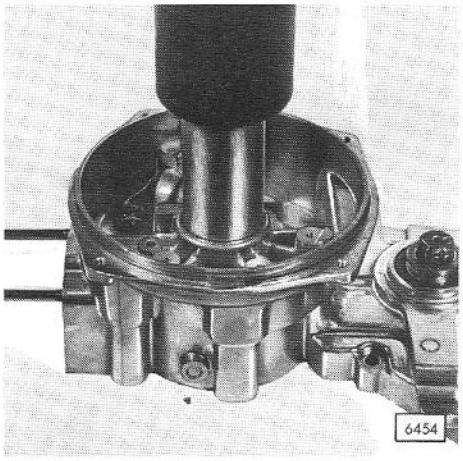


DISMANTLE ENGINE - 2 SPEED



Remove main bearing with special puller 905.0.34.101.0 for the generator side use puller cages 905.6.34.105.0 and puller cages 905.6.34.110.0 for the clutch side.

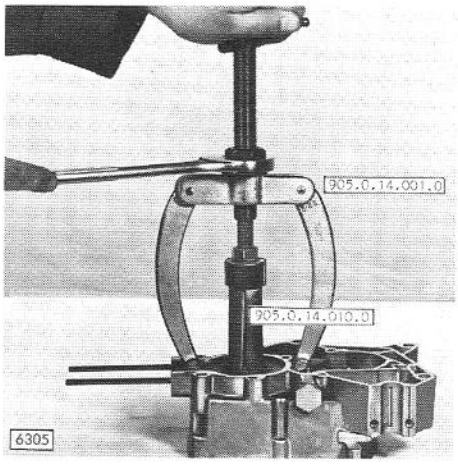




Inspect crankshaft and carry out all inspection and repair works as outlined in previous pages under "Crankshaft".
NOTE: If the crankshaft bushing is twisted and the oil supply holes are blocked or there are noticeable signs of abnormal wear, remove the bushing and replace with:

MAXI: Up to serial no. 5334443 part no. 321.1.12.617.3
From serial no. 5334444 part no. 321.2.12.617.3
MAGNUM: Up to serial no. 1602230 part no. 321.1.12.617.3
From serial no. 1602231 part no. 321.2.12.617.3

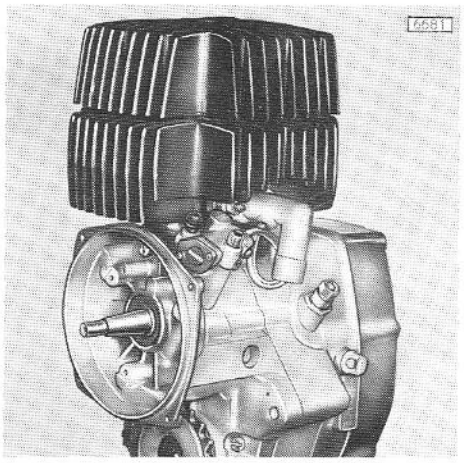
After removing the left hand crankshaft oil seal, drive out main bearing cup.



Use special puller 905.0.14.010.0 and 905.0.14.001.0 to remove right hand main bearing cup.

DISMANTLE OIL PUMP DRIVE

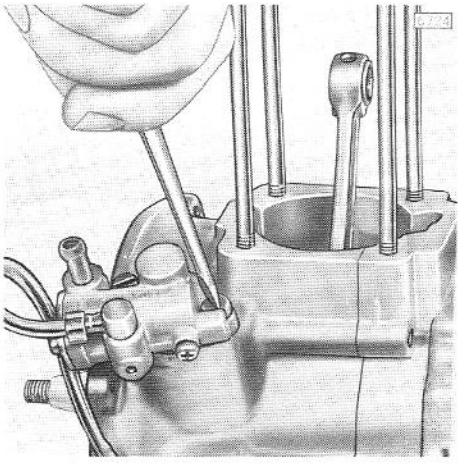
ENGINE WITH OIL PUMP MAGNUM MK II



Dismantling:

Follow same engine dismantling procedure as outlined under "dismantle engine". Disconnect oil line from inlet manifold.

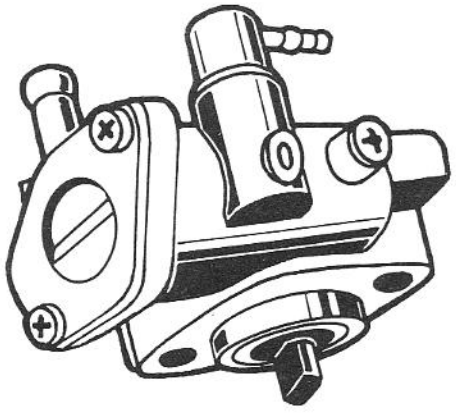
Remove oil pump and gasket from left housing half.



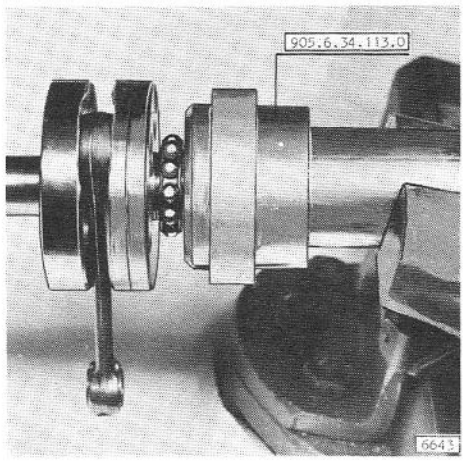
The oil pump is a non-repairable part and has to be replaced as a unit. It is a factory metered unit to obtain the correct lubrication ratio for the engine. It delivers 1.35 fl. oz (40 cc) at 1500 rpm per hour.

Testing oil pump delivery:

Fill gas tank with regular gasoline pre-mix. Remove oil pressure hose from intake manifold, place hose in a measuring container. Run engine for 4 1/2 min at 3500 rpm. Oil pump should deliver .0338 fl. oz $\pm$ .003 (10 cc $\pm$ 0,10). Repeat test at least once, if oil pump does not deliver required amount, replace oil pump assembly.

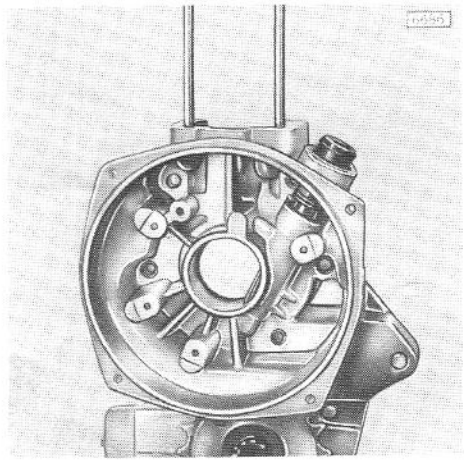


DISMANTLE OIL PUMP DRIVE



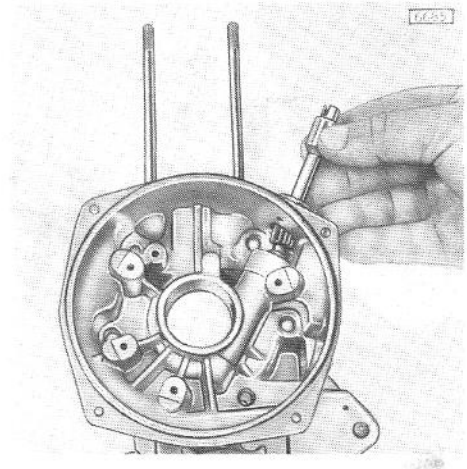
Having the engine completely dismantled, remove oil pump drive gear from crankshaft. Using puller 905.0.34.101.0 and cages 905.6.34.113.0.

Do not lose drive gear locating pin.



Remove crankshaft oil seal and drive shaft guide sleeve from housing half.

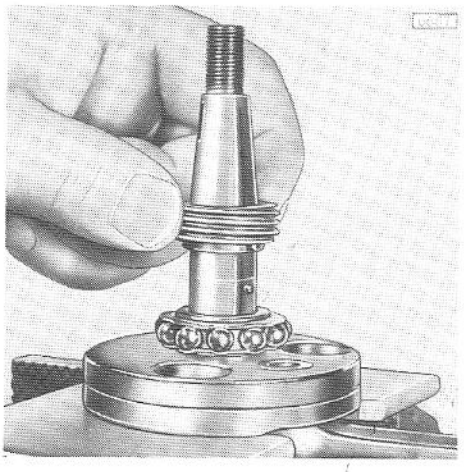
NOTE: Always replace "0" rings on guide sleeve to avoid leakage from crankcase.



Remove oil pump drive shaft and check for wear.
Do not lose thrust washers of lower end of drive shaft.

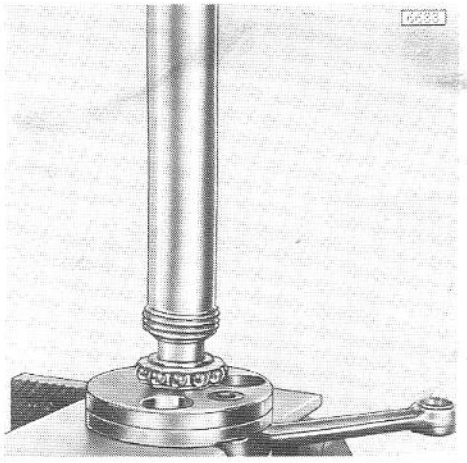
ASSEMBLE OIL PUMP DRIVE

Assembling:
After completion of all repair work on engine and end-float adjustment of crankshaft, place oil pump drive gear over crankshaft end.



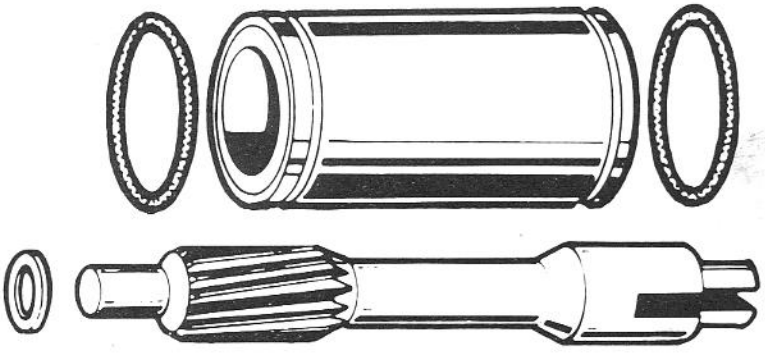
Ensure that drive gear locating slot and locating pin are in line.

Place special plate 905.0.33.104.1 between crank webs to avoid damage to crankshaft. Use installation sleeve 350.1.70.012.0 to install oil pump drive gear.

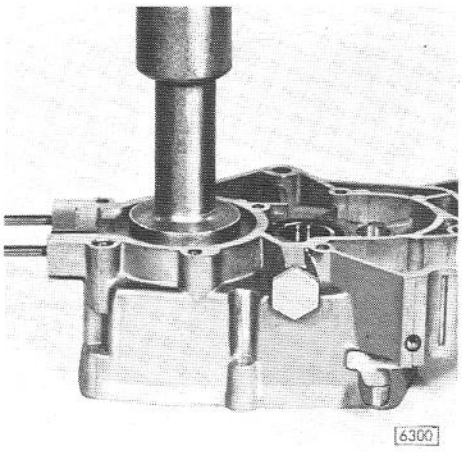


Oil pump drive shaft must be placed in crankcase before installing the guide sleeve.

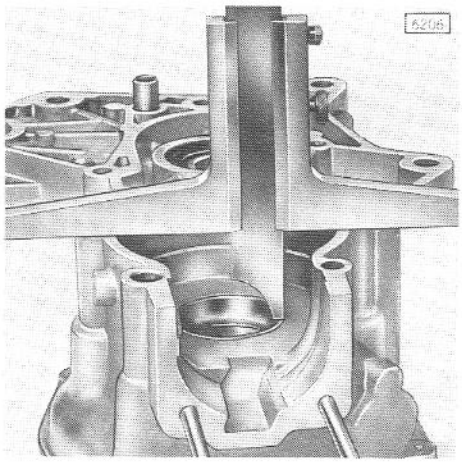
Before installing the drive shaft guide, replace the two (2) "0" rings on guide sleeve. For easier installation lubricate both "0" rings.



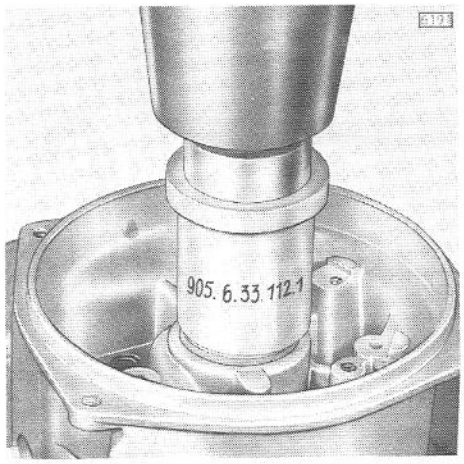
ASSEMBLE ENGINE - 2 SPEED



To install new bearing cups, warm up housing halves to appr. 170° F (80° C) and press in bearing cups.



After installation of bearing cup measure with a depth gauge on four opposite points of the perimeter to ensure cup is squarely seated.

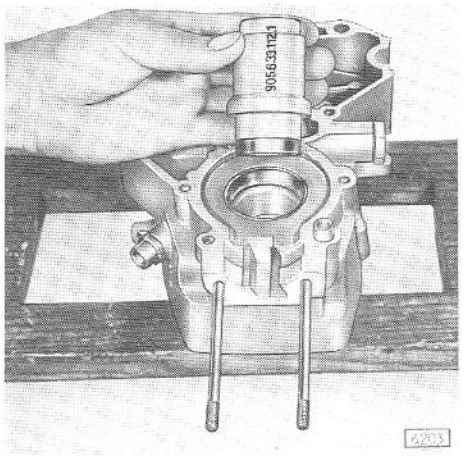


Installations of seals
Left hand crankcase half:
Crankshaft and drive shaft seals are pressed into position with the sealing lips facing inwards using tool no. 905.6.33.112.1.
A double lip seal is used in the left hand (generator side) crankcase half. Lubricate seal lips before installation.
With using this special seal-installer, the correct installation position will be obtained, .472 in. (12 mm) down from the upper edge (not MAGNUM MK II).
On MAGNUM MK II, install seal flush with outer side of crankcase (magneto side).

ASSEMBLE ENGINE - 2 SPEED

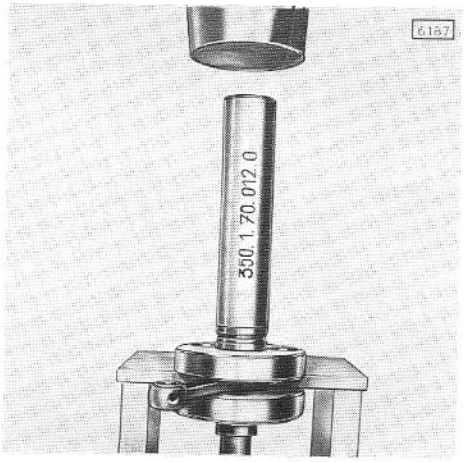
Right hand crankcase half:

Install crankshaft seal with the sealing lip facing the clutch side using special tool no. 905.6.33.112.1 in order to prevent obstruction of the main bearing lubricating hole.

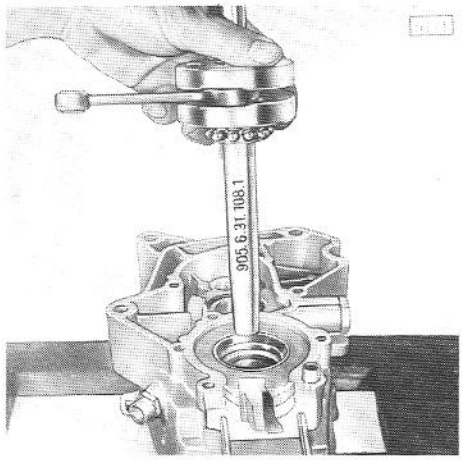


INSTALL CRANKSHAFT

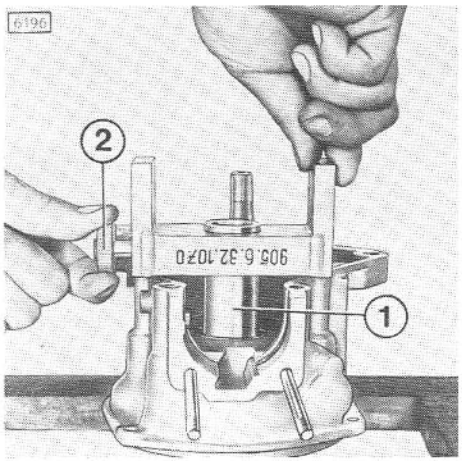
Before installing the clutch side bearing fit a .004in. (0,10 mm) shim.
Press on the clutch side inner bearing race. To install, use special sleeve 905.6.33.111.2 and the special plate 905.0.33.104.1 between the two crankshaft webs. When pressing on the bearing race, the bearing identification marks should be located outboard.
Crankshaft end-float .002 - 006 in. (0,05 - 0,15 mm).



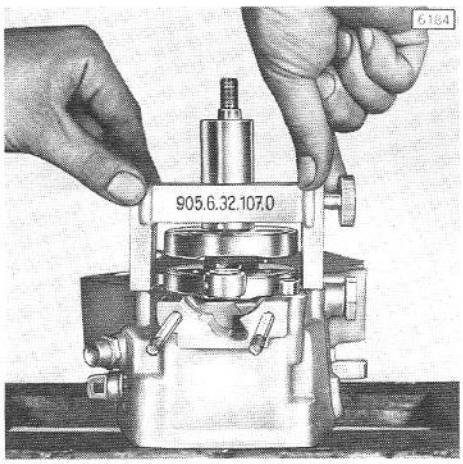
Insert the crankshaft, with bearing pressed into position, in the right crankcase half, and locate a new gasket in position over the hollow dowels. When installing the crankshaft use installation sleeve no. 905.6.31.108.1 to avoid damage to the lips of the seal.
NOTE: It is very important to use a new and genuine gasket, or correct end-float measurements are not obtainable.



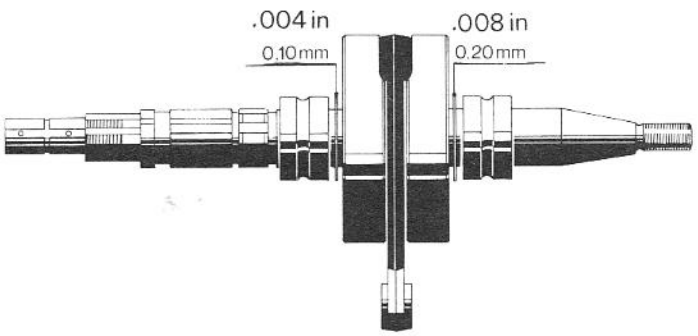
ASSEMBLE ENGINE - 2 SPEED



Put the bearing inner race with the cage into the left crankcase half (bearing identification marks facing downward) and set up the measuring device no. 905.6.32.107.0 as shown. Adjust the tool measuring sleeve (1) into the inner bearing race and locate in position with the setscrew (2).



Take off gauge, and invert before positioning over the crankshaft.
Compensate for the clearance between the measuring sleeve and the ground bearing stop on the cranskhaft journal by using shims.
These shims are available in the thickness of:
.002; .004; .008; .012 in. (0,05; 0,10; 0,20; 0,30 mm) magneto side .004; .008 in. (0,10 and 0,20 mm) clutch side.

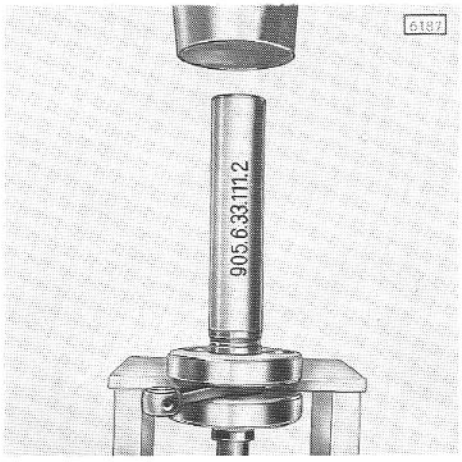


Adjustment hint:

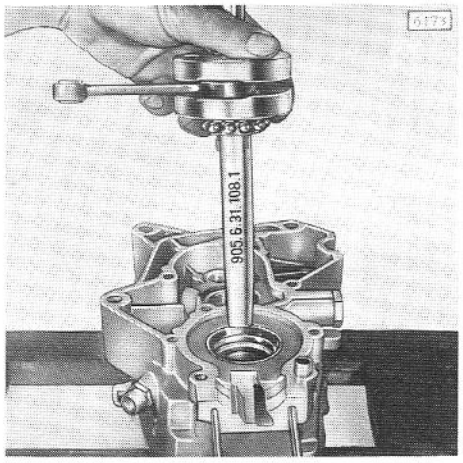
The specified end float of .002 - .006 in. (0,05 - 0,15 mm) is obtained when the crankshaft slightly touches the gauge with the gauge pressed firmly on the gasket.
If the thickness of the shim needed is beyond .008 in (0,20 mm) in the one side, then the shims must be apportioned equally to the left and right hand sides.

ASSEMBLE ENGINE - 2 SPEED

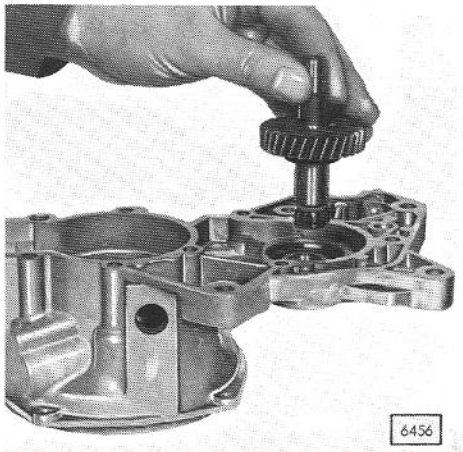
After the correct measurement has been obtained, place shim(s) on the crankshaft and press on inner bearing ring. (Bearing identification marks facing outward on crankshaft). Using installation sleeve no. 905.6.33.111.2 (clutch side) and no. 350.1.70.012.0 (generator side), place special plate no. 905.0.33.104.1 between crank webs to prevent damage to crankshaft.



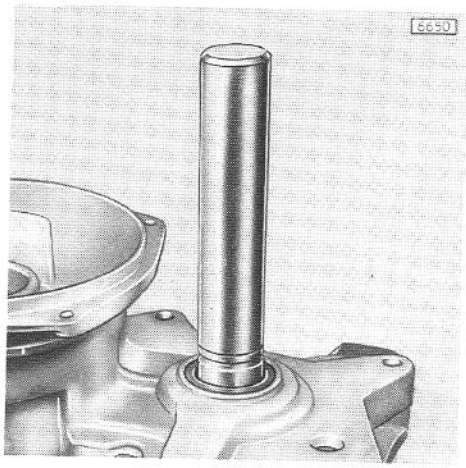
Place protecting sleeve 905.6.31.108.1 over crankshaft (clutch side) and install shaft in right hand housing half. Fit both hollow dowels and place new gasket on housing.



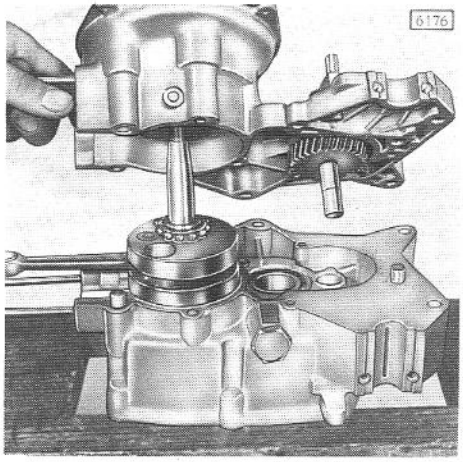
If bearing has been removed, install bearing and circlip. Install seal and drive shaft in left housing half.



ASSEMBLE ENGINE - 2 SPEED

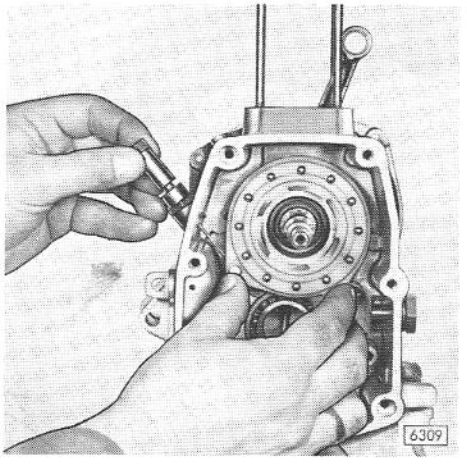


Press sleeve with the tool 905.6.33.111.2 on drive shaft.



While rotating crankshaft place both crankcase halves together.

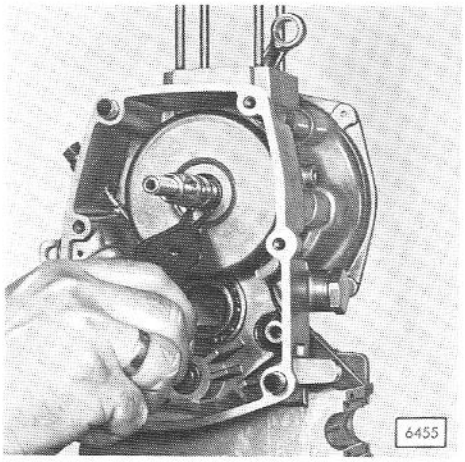
⚠ **Do not force halves together.**
Replace screws and torque to 6 ft/lb (8 Nm).
Again rotate crankshaft to ensure correct installation.



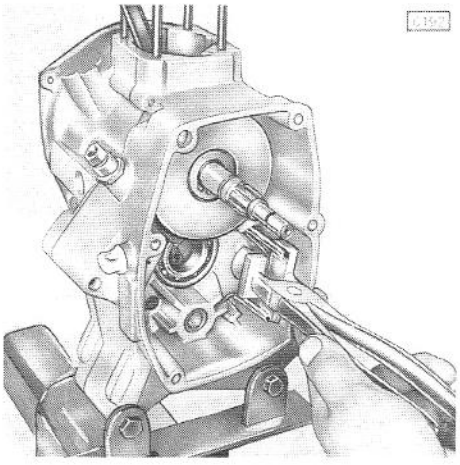
Place engine into engine holder 905.6.36.108.0. Replace engaging plate into housing and screw the adjusting nut into the starter cable.
NOTE: Starting clutch adjustment will be carried out later.

ASSEMBLE ENGINE - 2 SPEED

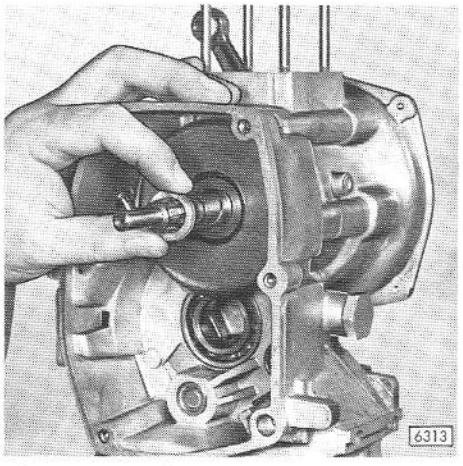
Install starter plate, spring, washer and circlip.



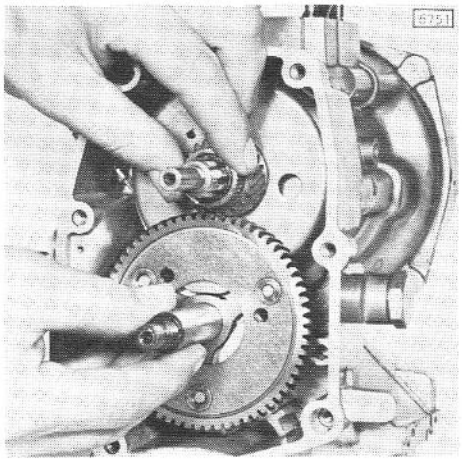
Install engaging plate return spring using tool no. 905.6.41.101.2.



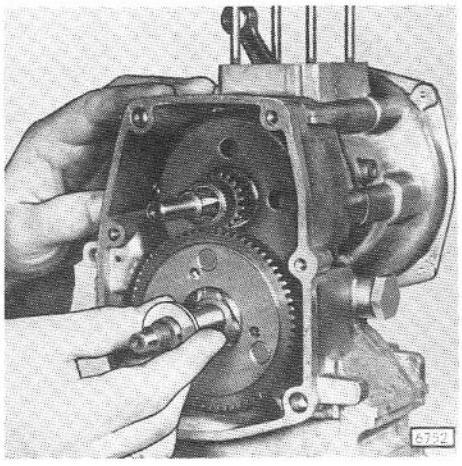
Place thrust washer on crankshaft.



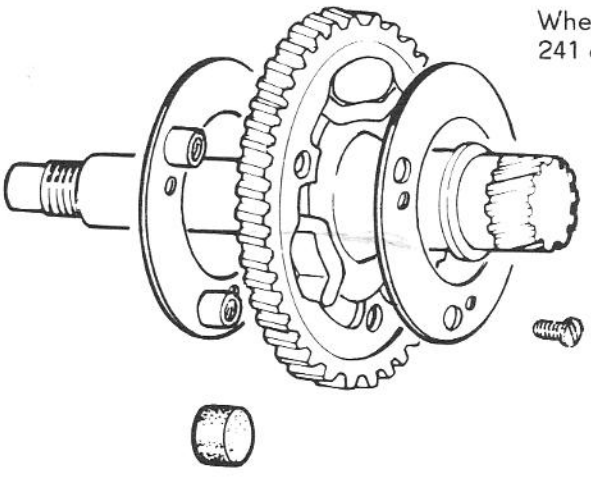
ASSEMBLE ENGINE - 2 SPEED



Install second gear driving plate and main shaft in housing.



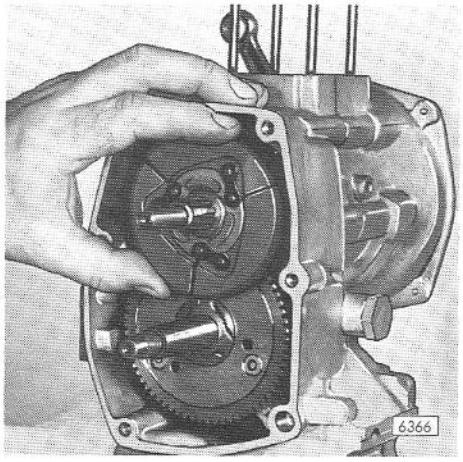
Place thrust washer on main shaft.



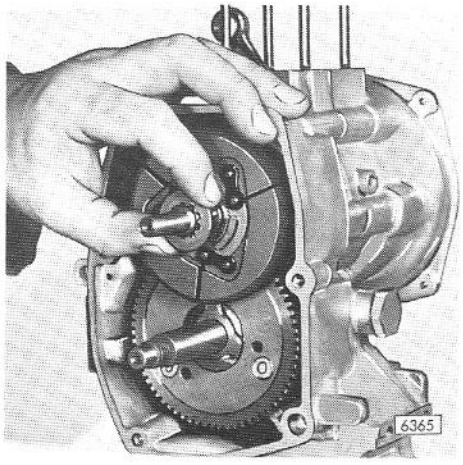
When assembling second speed gear damper, use Loctite 241 on threads and install screws from inside facing outward.

ASSEMBLE ENGINE - 2 SPEED

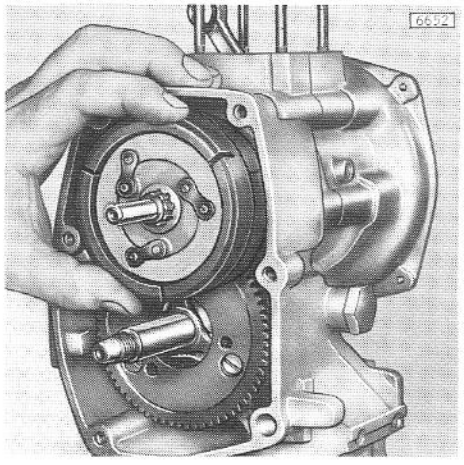
Install second speed centrifugal clutch, spring out cover plate facing inward.



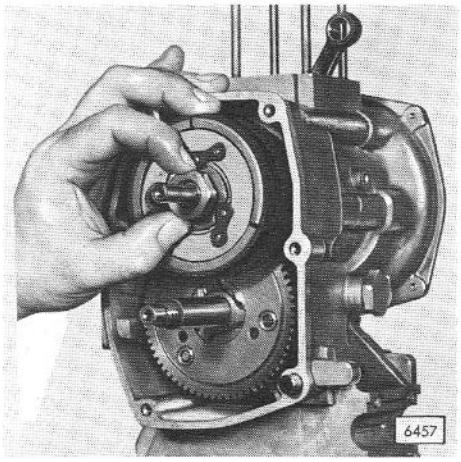
Replace spacer with the cone shaped side facing inward.



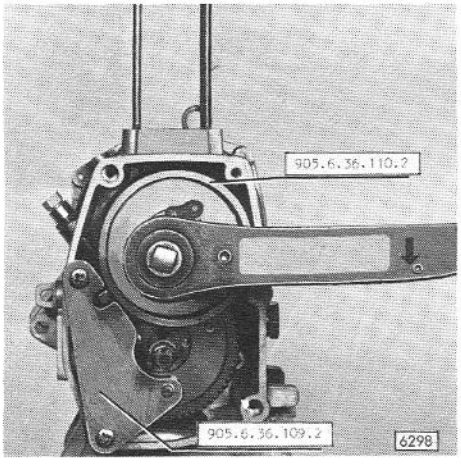
Install first speed centrifugal clutch, spring cover plate facing outward.



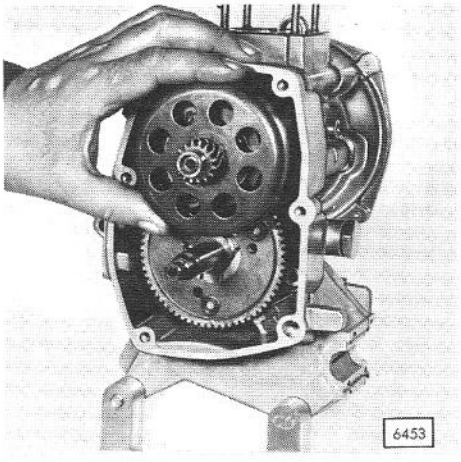
ASSEMBLE ENGINE - 2 SPEED



Place new locking tab washer and replace nut.



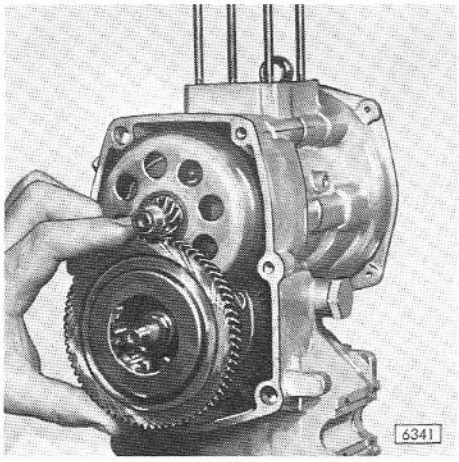
Lock the first speed clutch and second gear main shaft using special tools no. 905.6.36.110.2 and 905.6.36.109.2. Torque nut to 22 - 29 ft/lb (30 - 40 Nm) and secure lock nut with the locking tab washer. Remove clutch locking tool.



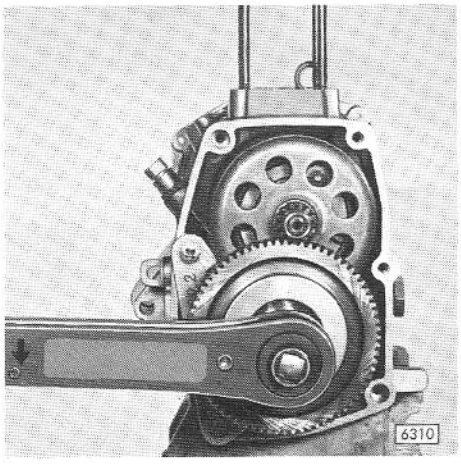
Lubricate bushing on end of crankshaft and install clutch drum.

ASSEMBLE ENGINE - 2 SPEED

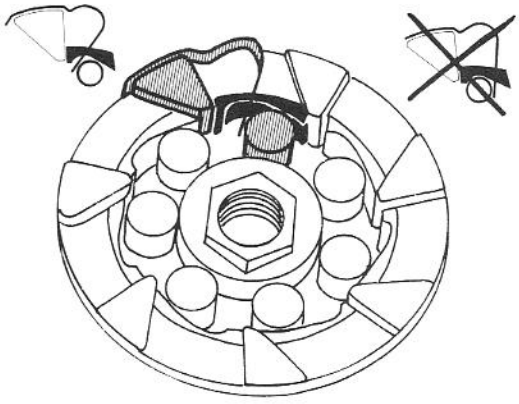
Place first speed gear onto main shaft.

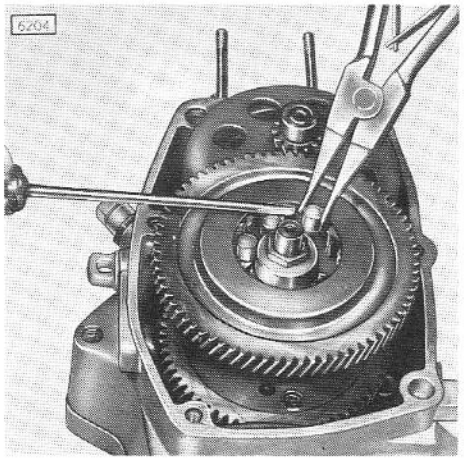


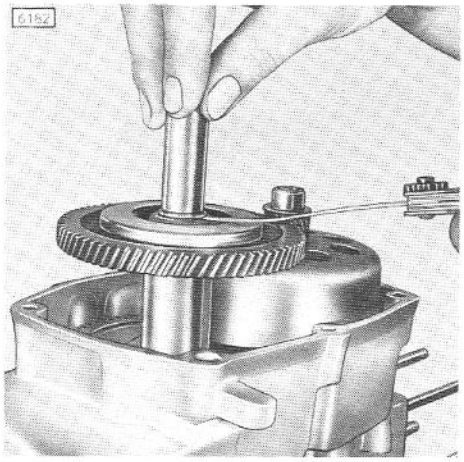
Re-fit special nut (left hand thread) into main shaft and torque to 25-36 ft/lb (35-50 Nm). Remove second speed gear locking tool.



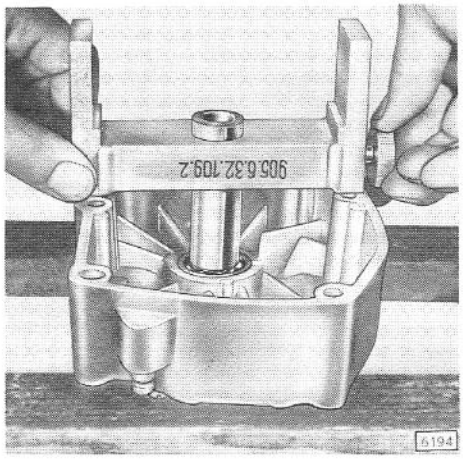
Insert the first speed gear rollers, by pushing springs back and placing rollers in position against the spring tension. Remove engine from engine stand and place on assembly table.







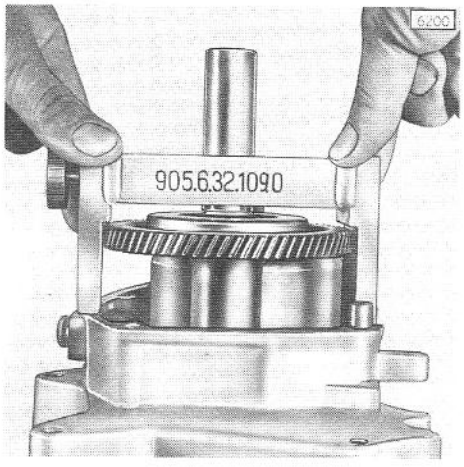
Install roller retainer thrust plate. Ensure that the head of the special nut protrudes through the thrust plate. Now place a thick shim over the end of the main shaft.
While holding down shim measure gap between special nut and shim. This gap must be .002 - 010 in. (0,05 - 0,025 mm). To obtain the correct end-float the thrust plate is available in 6 different thicknesses. Sizes of thrust plates are .165; 173; .181; .189; .197; .205 in. (4,20; 4,40; 4,60, 4,80, 5 and 5,20 mm).



MEASURING MAIN SHAFT AND CLUTCH DRUM END-FLOAT

When installing new bearings in clutch cover, heat cover to appr. 170° F (80° C) and press bearings into place.

A special measuring tool no. 905.6.32.109.0 is used to measure the end-float between the first speed gear main shaft and the clutch cover.
Fit a new gasket to the cover, place measuring device firmly on top of the gasket. Slide down the measuring sleeve to contact the inner surface of the bearing. Hold measuring device firmly against gasket and bearing and lock measuring sleeve in that position.



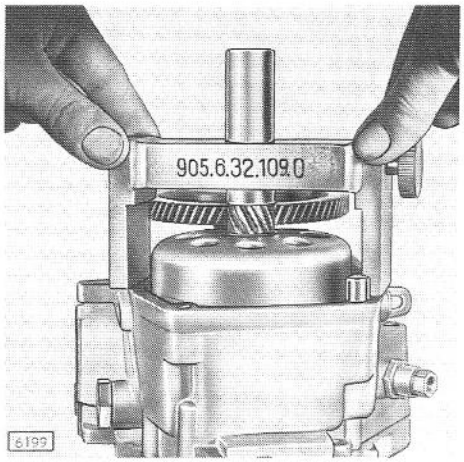
Now invert and place measuring tool over the main shaft. Compensate the gap between measuring sleeve and main shaft with the use of shims provided. Shims are available in .024 .031 and .040 in. (0,60; 0,80 and 1 mm).

NOTE: It is very important to use a new and genuine gasket, or correct end-float measurements are not obtainable.

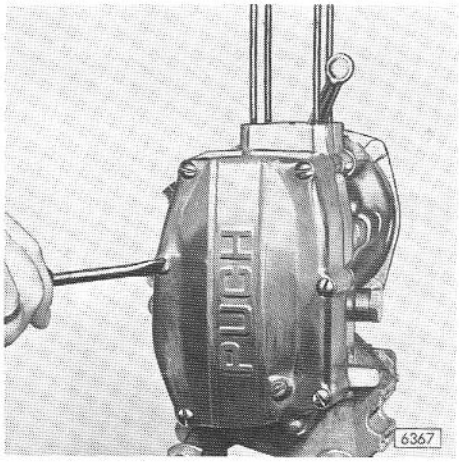
The specified end-float of .002 - .010 in. (0,05 - 0,25 mm) is obtained when the shim(s) are flush against the measuring sleeve with the gauge pressed firmly on the case flange.

ASSEMBLE ENGINE - 2 SPEED

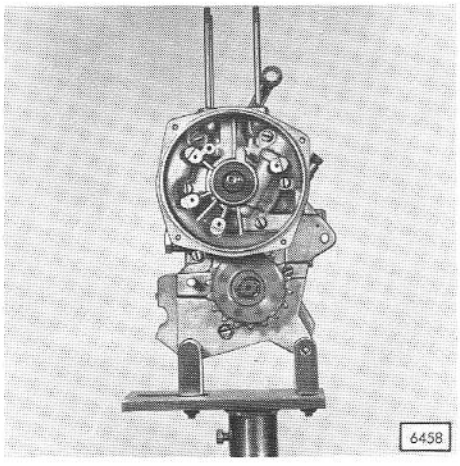
The same procedure should be used for the shimming of the clutch drum. Shims are available in the size of .024; .031 and .040 in. (0,60; 0,80 and 1 mm). The correct end-float on both shafts is only obtained by using a new gasket. End-float is between .002 - .010 in. (0,05 - 0,25 mm).



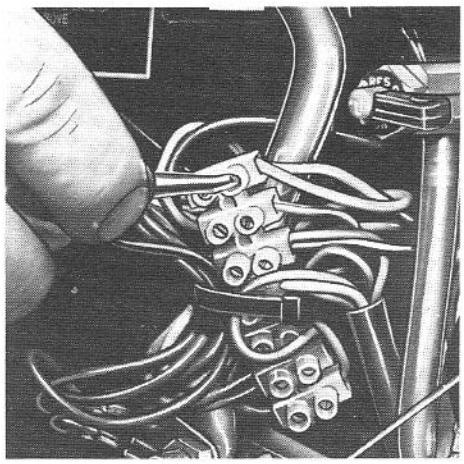
Place engine in special holder 905.6.36.108.0.
When installing new bearings in clutch cover, heat cover to appr. 170° F (80° C) and press bearings into place.
Fit new gasket, install both hollow dowels and fit clutch cover.
Torque screws to 6 ft/lb (8 Nm).



Install drive sprocket on main shaft and replace circlip.
Continue to assemble engine as outlined on previous pages.

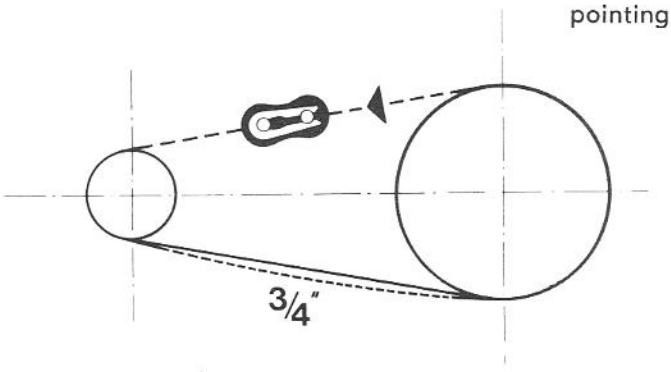


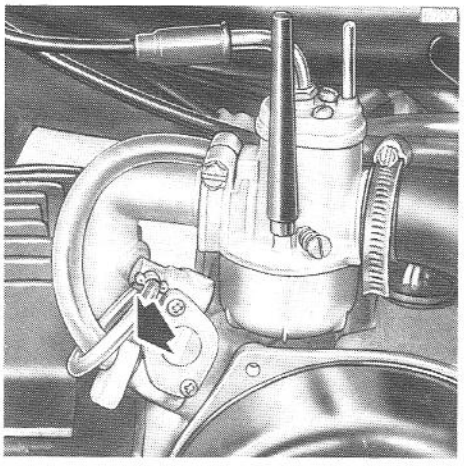
INSTALL ENGINE - 2 SPEED



Install engine in frame and torque mounting bolts to 23 ft/lb (32 Nm).
Re-connect electrical wires at junction block (color to color)

Install drive chain, take care that the tension is correct and the connecting link is properly placed with the closed end pointing in the direction of chain travel.





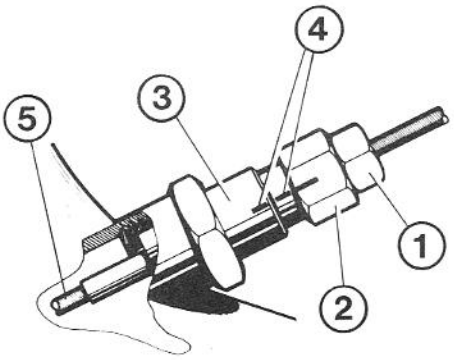
MAGNUM MK II

Install oil pressure line between manifold and oil pump. Connect oil supply line to oil pump. If an air bubble is visible in the oil supply line between oil tank and and oil pump, bleed by off squeezing the oil supply line.

Ensure bleeding procedure is carried out each time hose has been removed from oil tank or oil pump.

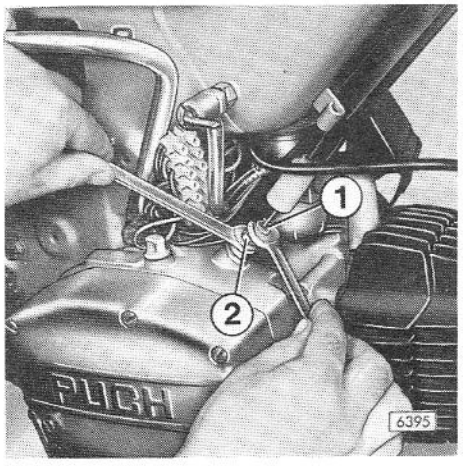
INSTALL ENGINE - 2 SPEED

Turn the adjustment nut (2), for the short starting cable (5) to the right until rear wheel is dragging when turning by hand.
Mark this position (4) on the adjustment nut and sleeve.
From the applied mark turn adjustment nut **six** full turns to the left – with **new** starting clutch or **seven** turns to the left – with a **run-in** starting clutch.
This adjustment assures the needed clearence of .008 – .012 in. (0.20 – 0.30 mm) between the starting clutch and the engaging plate.
No. 1 identificies the starting cable with securing nut.
No. 3 identificies the sleeve.

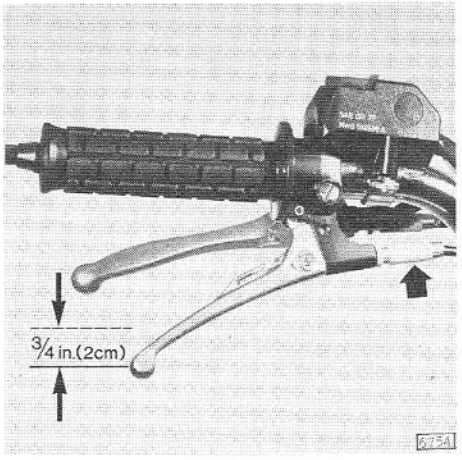


Reconnect starter cable (1) to adjustment nut (2).

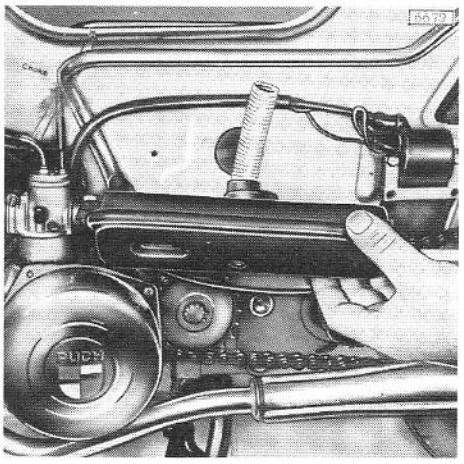
Do not turn adjustment nut on engine, only the securing nut on the starter cable.



To replace ,starter cable remove clamp screw on starter lever and remove cable.
Free travel adjustment of starter cable is made on the adjuster, near starter lever (arrow).
Free play should be 3/4 in. (2 cm) measured at the end of the starter lever play.



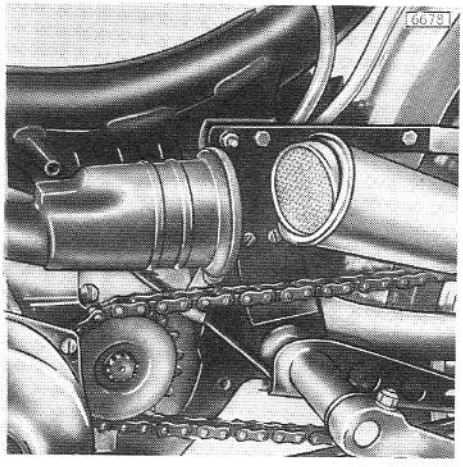
INSTALL ENGINE - 2 SPEED



FIT CARBURETOR

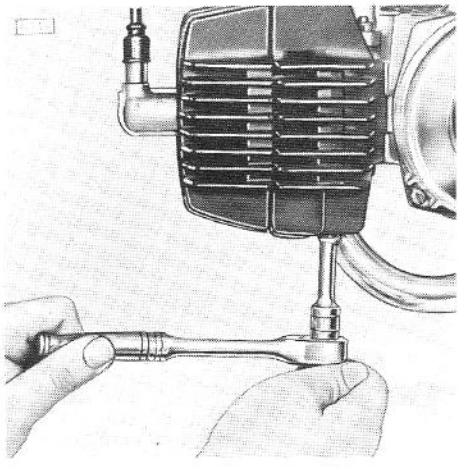
Mount carburetor and re-install air filter assembly.

Do not push intake hose too deeply into filter assembly as this could cause air flow restriction.



Air filter assembly MAGNUM

Before installing air filter assembly, clean metal filter element with gasoline or similar cleaning material, blow completely dry with compressed air and spray filter element lightly with engine oil.



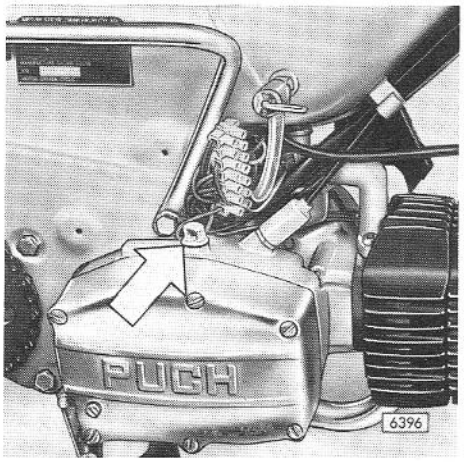
FIT EXHAUST PIPE AND SILENCER

Ensure to use a new gasket between exhaust pipe and cylinder.

NOTE: Do not make any alterations on the exhaust system or poor operating conditions may result.

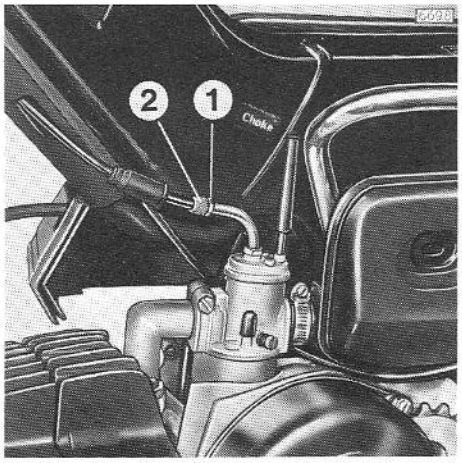
ENGINE IDLE

Fill transmission at fill plug (arrow) with automatic transmission fluid „Type F".
NOTE: Do not overfill transmission.
Oil capacity:
2 speed automatic . . . . . 9½ fl. oz. (280 cc)



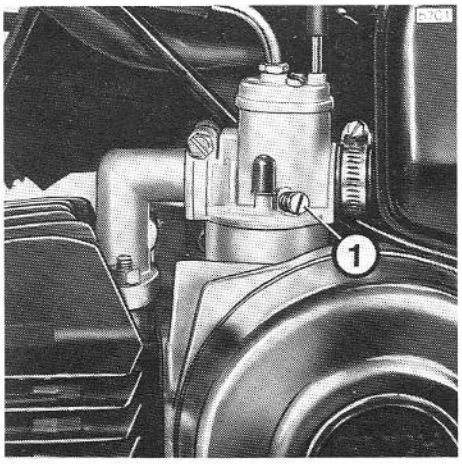
THROTTLE CABLE ADJUSTMENT

Check for proper throttle cable slack (.040 in./1,0 mm). Insufficient cable slack will hold the throttle partially open and the idle adjusting screw will not function. If necessary, loosen the cable locknut (1) and turn the throttle cable adjuster (2) to the right to increase cable slack. Retighten the cable locknut.



IDLE ADJUSTMENT

Start engine and run at moderate speed until operating temperature is reached. Adjust idle speed to 800 - 1200 rpm by turning idle adjustment screw (1) in or out as required.



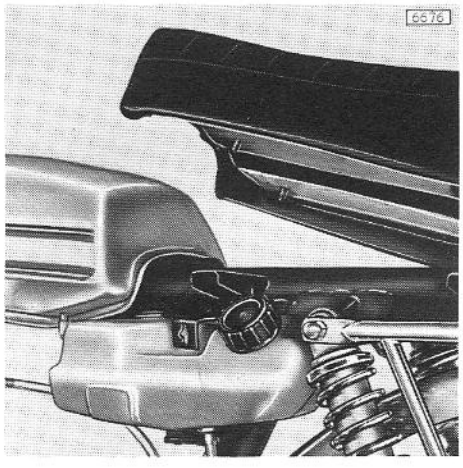
OIL TANK - FUEL TANK



Oil tank-MAGNUM MK II

To remove oil tank, remove left side cover, disconnect and block oil supply hose and remove oil tank from its mounting base.

⚠ **On refitting and connecting oil supply hose ensure there are no air bubbles visible in the oil supply hose.**



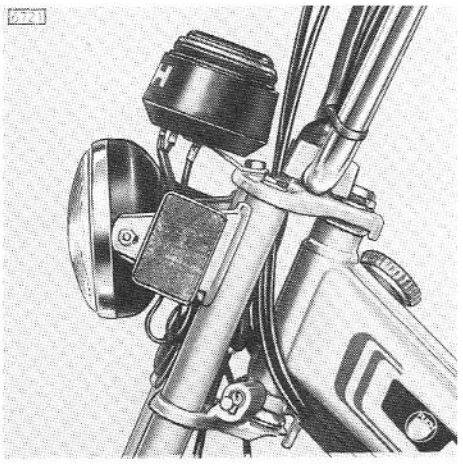
Fuel tank, MAGNUM

To remove fuel tank, remove the seat mounting nuts and lift seat of frame.
The fuel tank is mounted on rubber pads in front and rear. Turn fuel tap to "Off" position, disconnect fuel cross-over line and the line from the fuel tap. Lift the tank to the rear and remove.

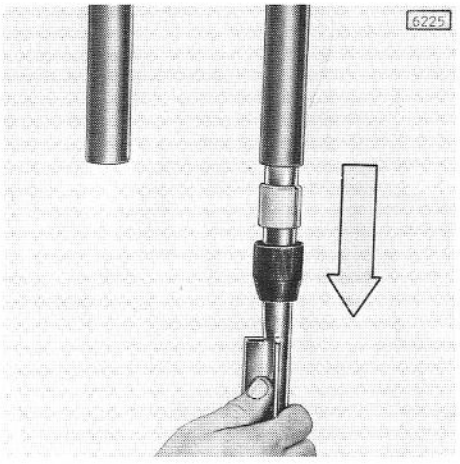
FRONT FORK - MAXI

DISMANTLE FRONT FORK

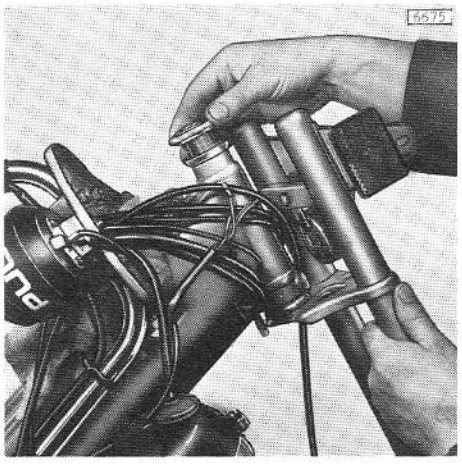
Disconnect front brake cable and speedo drive cable. Unscrew both axle nuts and remove front wheel.
Remove front fender and headlamp.
Remove the two (2) top bridge hexagonal bolts.

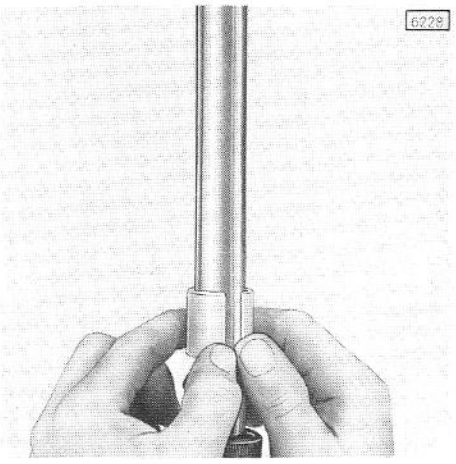


Pull both sliding tubes down and out of fork tubes.



Remove steering stem nut, lift off top bridge and handlebar assembly and place over frame.
Remove lower steering stem nut and pull down bottom bridge assembly.





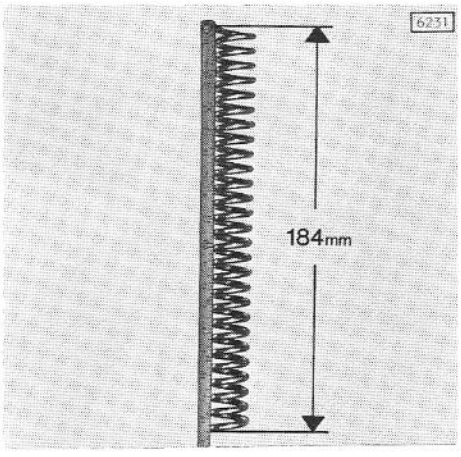
Open plastic bushing and remove from tube.

Plastic guide bushing:

New:	**Wear limit:**
1,06 in. Ø	**1,04 in. Ø**
26,95 mm Ø	**26,5 mm Ø**



Inspect all parts and replace if necessary.



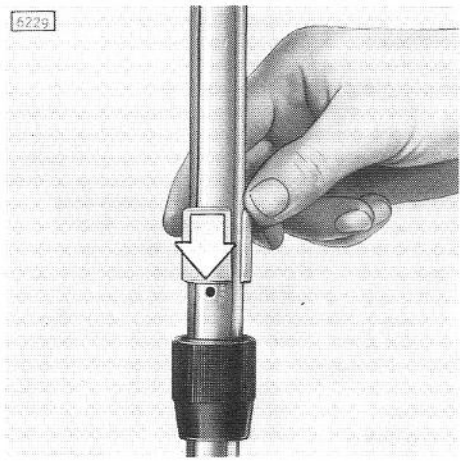
Check springs for wear and replace if weak.

SPRING DIMENSIONS:

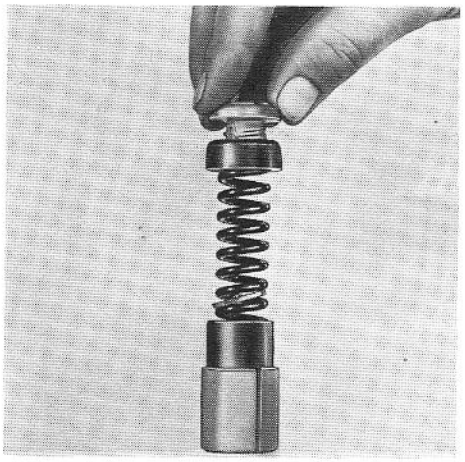
Wire Diameter .118 in. (3 mm)
Spring length
New: 7,24 in. (184 mm)
Wear limit: 6,90 in. (175 mm)

ASSEMBLING FRONT FORK

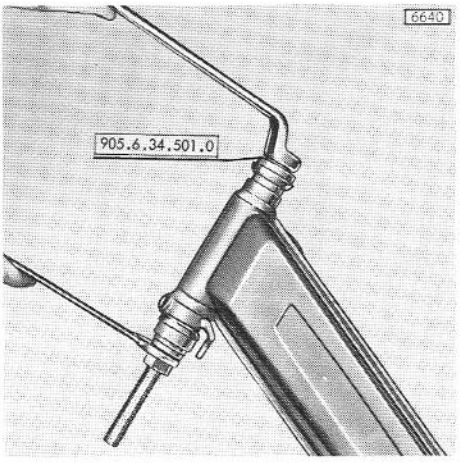
Place dust covers over sliding tube.
Fit both plastic guide bushings. Place locating tab on inside of bushing in position on lower sliding tube.

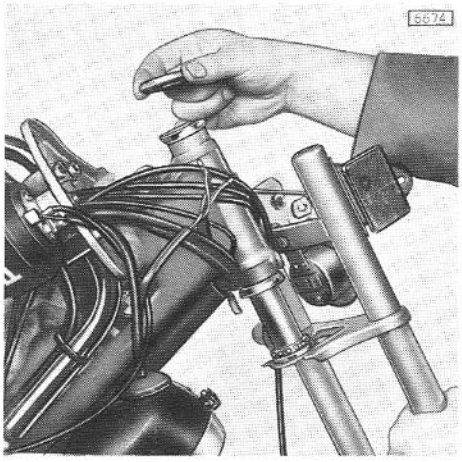


Insert spring in lower tube and rubber stop inside spring. Place damper rubber over spring end and screw on top threaded coupling.



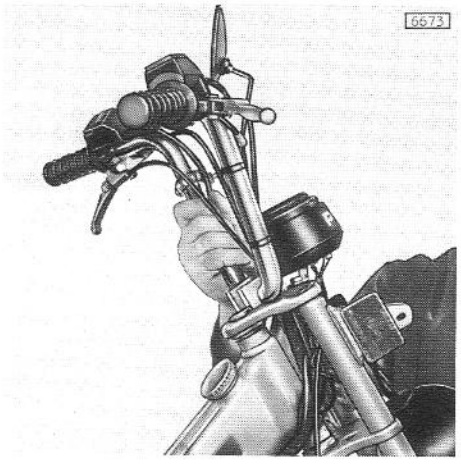
Knock out steering head bearing cups and install with special tool 905.6.34.501.0.



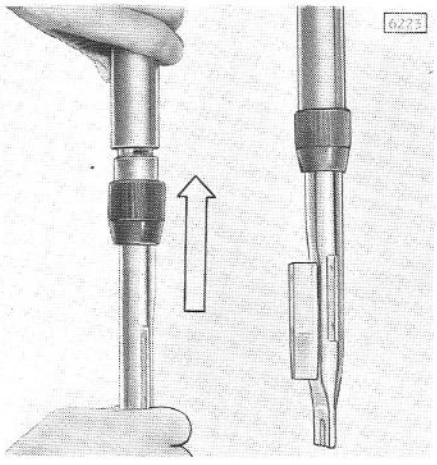


Lubricate both bearing cones and cups and install bottom bridge.

NOTE: Do not tighten lower nut, front fork must turn easy but no play noticeable.



Replace top fork bridge, torque steering head nut to 30 ft/lb (41 Nm). Recheck steering head bearing for clearance.

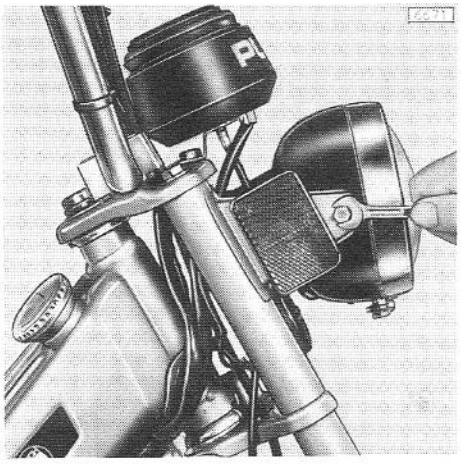


Lubricate guide bushings and insert in lower fork tubes.

Torque bridge bolts to 11 ft/lb (15 Nm).

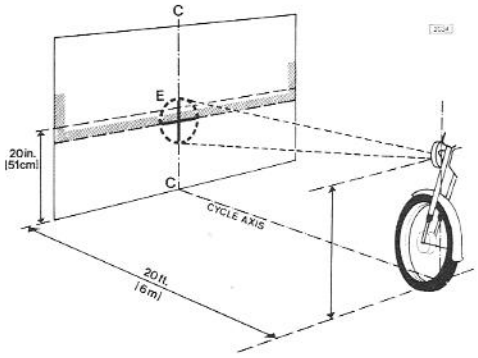


Install headlamp, front fender and front wheel.
Adjust headlamp.



Adjusting the headlamp

Adjust the headlight with the machine running. Correct adjustment is to have the center spot of the beam 20 inches above the ground measured with the moped positioned 20 feet from the focus point.



FRONT FORK - MAGNUM II



DISMANTLING

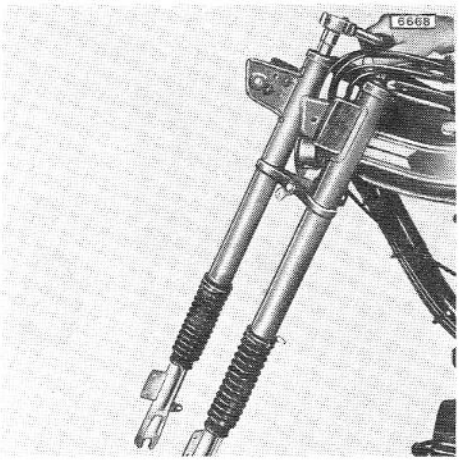
FRONT FORK, MAGNUM II (also MAGNUM XK)

After removing the front wheel, fender handlebar, headlamp and speedometer, remove the top bridge bolts.
Remove both sliding tubes from fork tubes and inspect for wear. If lower or upper fork tubes are worn or bent, replace as a unit.



To replace spring or rubber stop inside spring, unscrew spring from coupling.

Spring length:	New	7.68 in. (195 mm)
	Wear limit	7.28 in. (185 mm)
Rubber stop length:	4.72 in. (120 mm)	
Wire diameter:	.14 in. (3,5 mm)	



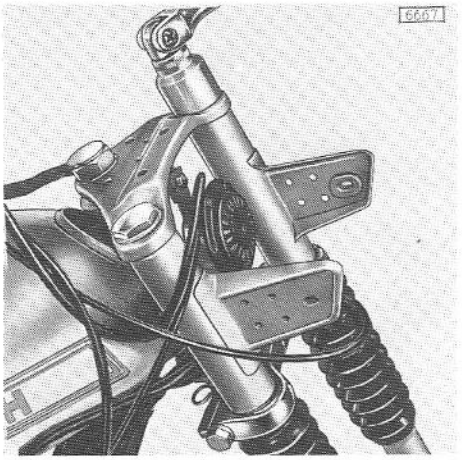
ASSEMBLING

Assemble the front fork in the reversed order to dismantling. Lubricate lower sliding tubes with grease prior assembling. Torque upper bridge bolts to 11 ft/lb (15 Nm).

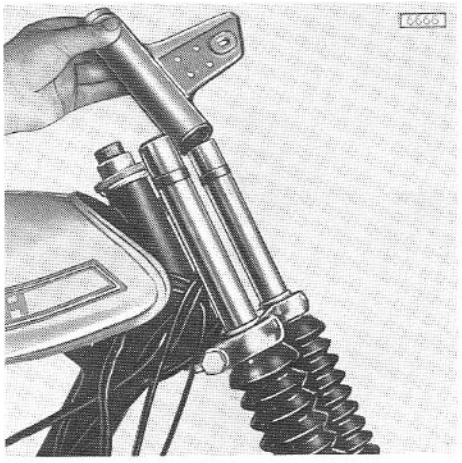
DISMANTLING

HYDRAULIC FRONT FORK MAGNUM MK II

After removing cockpit, headlamp and handlebar unscrew the two (2) upper bridge sealing plugs and washers.



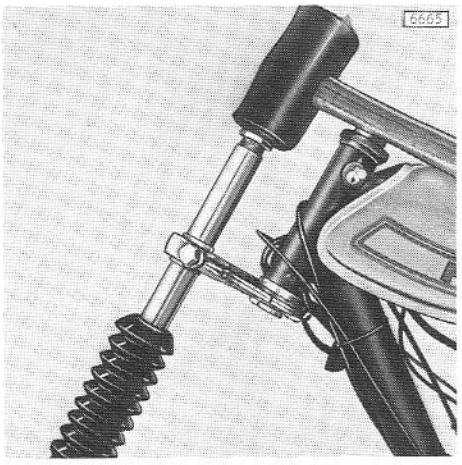
Further removing the two (2) upper tube clamp bolts (arrow). Remove the top fork bridge, both headlamp carriers and sealing bands.

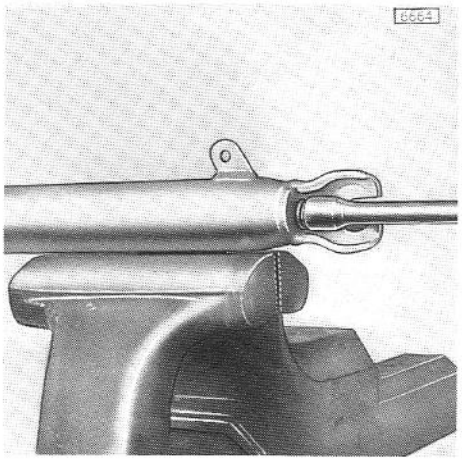


Pull down both tube assemblies.

NOTE: If tubes are very tight in lower fork bridge, replace sealing plugs in inner tube assemblies and drive out tube assemblies using a rubber or plastic hammer.

NOTE: Before proceeding further, drain off oil from tubes.



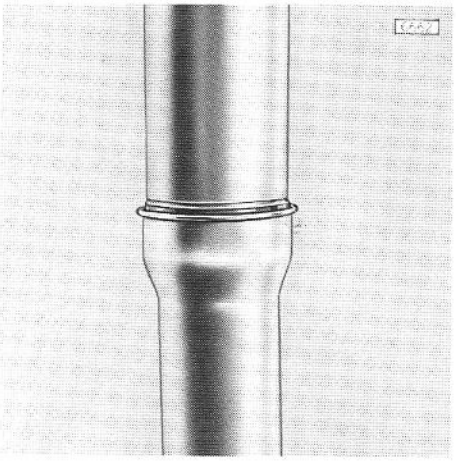


Place lower tube in a vise, using soft jaws to prevent damage to lower tube, and remove nut to separate the upper and lower tube assemblies.



Inspect all parts for wear and replace if required.

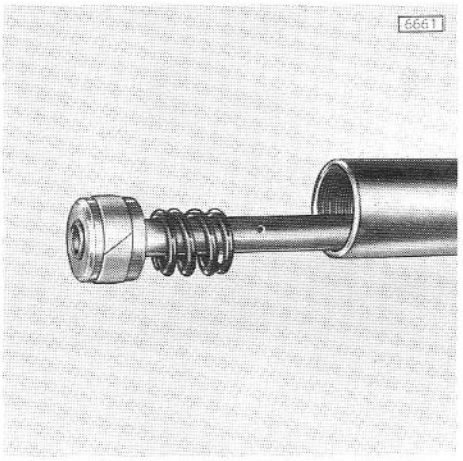
NOTE: Always replace lower fiber washer, "O" ring, guide ring on piston and seals in sliding tubes to ensure perfect sealing of hydraulic fork.



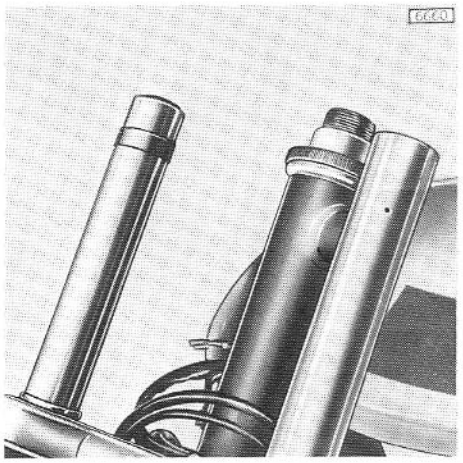
ASSEMBLING

Install seals in lower sliding tubes.

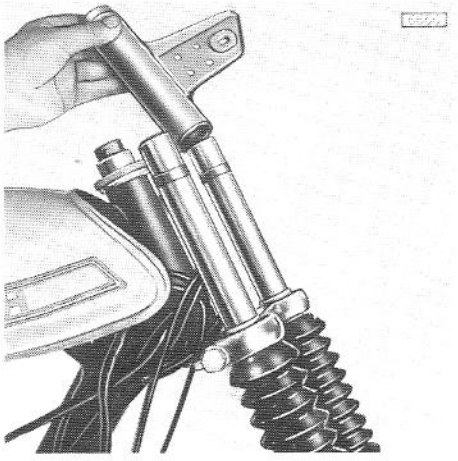
Install seals in lower sliding tubes.
Install new wear ring on piston, fit damper spring (short) over piston rod and insert piston assembly in fork tube. Place damper spring (long) over piston rod and small "0" ring on bolt shaft. Assemble upper and lower fork tubes. Before installing nut on end of piston rod, place a new fiber washer over rod end.



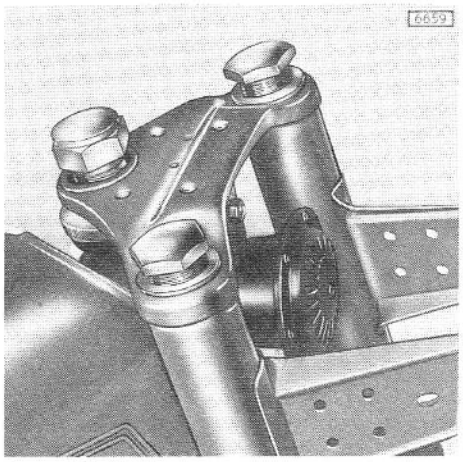
Place rubber bellows over tube assemblies and insert tubes in lower fork bridge.
NOTE: Do not clamp tubes in lower bridge till top bridge is installed. Place rubber sealing bands (p.n. 321.1.30.859.1) over upper tube breather holes.
NOTE: These rubber sealing bands prevent the drainage of oil from fork when moped is layed over on its side.



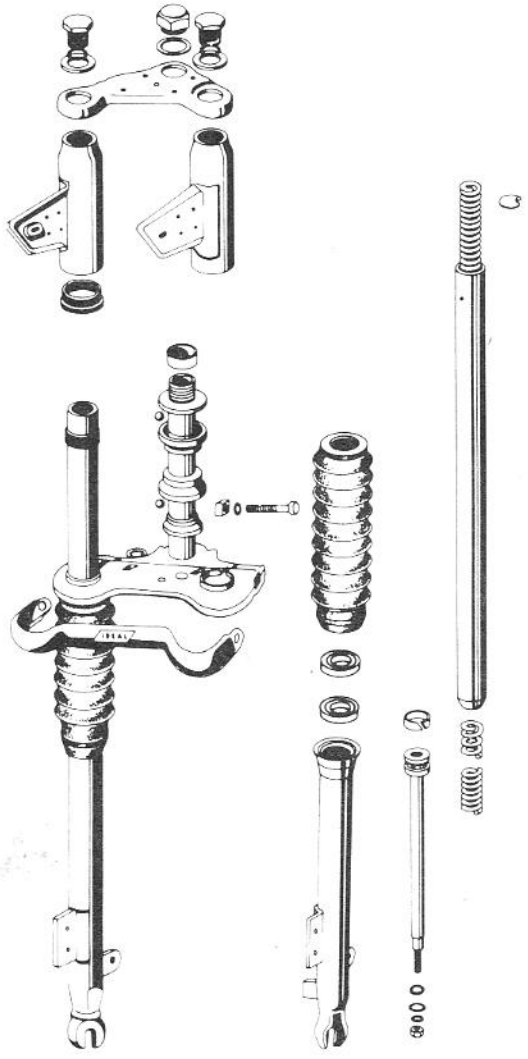
Place both headlamp carriers over upper tubes, ensuring the rubber guide rings are positioned inside carrier tubes.



FRONT FORK - MAGNUM MK II



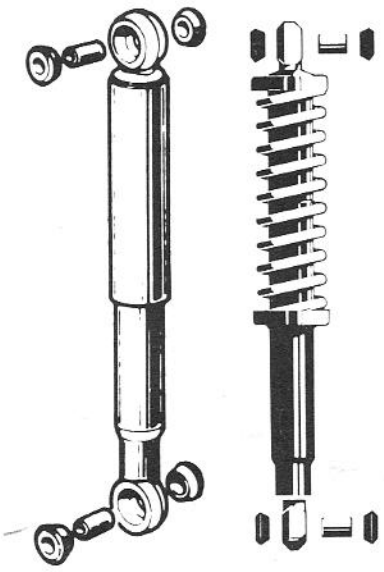
Replace top fork bridge and align with upper fork tubes.



Fill both tubes with oil.
Quantity: 4 oz. (120 cc) per fork tube
Quality: SAE 20-30 motor oil
Spring length: New 16.69 in. (424 mm)
Wear limit 16.29 in. (414 mm)
Wire diameter: .14 in. (3,5 mm)

Replace both top sealing plugs with washers. Ensure to replace both "0" rings for perfect sealing. Torque both plugs and steering head nut to 20 ft/lb (27 Nm).
Retighten lower fork bridge clamp screws to 40 ft/lb (54 Nm).

SHOCK ABSORBERS - REAR SWING ARM



SHOCK ABSORBERS

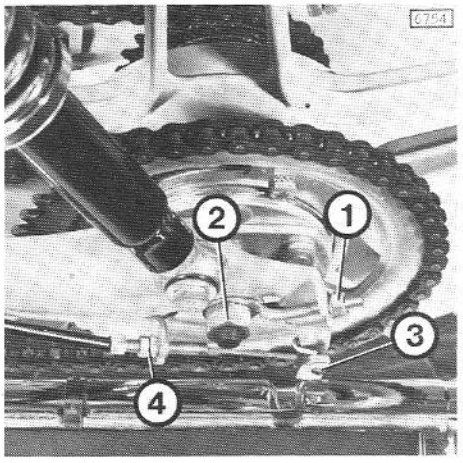
Shock absorbers are not serviceable, faulty units must be replaced.
Only the upper and lower rubber mountings and bearing bushings are available.

MAGNUM MK II

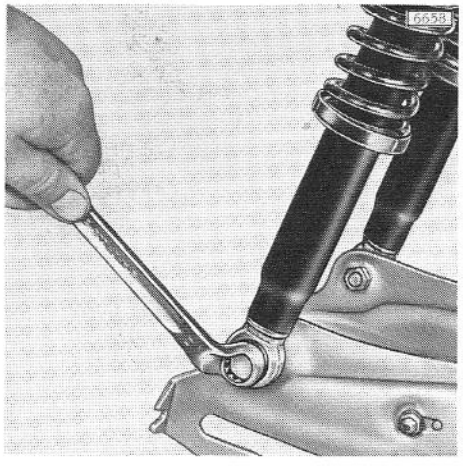
This shock absorber is a true hydraulic unit but not serviceable, if faulty, replace as a unit.

REAR SWING ARM

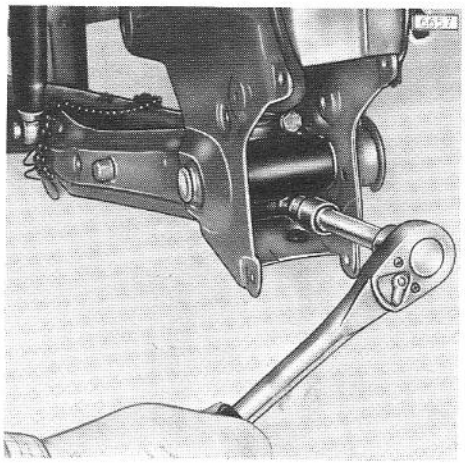
Remove engine according to repair manual.
Remove rear axle nuts (2), loosen chain tensioners (1), rear brake cable adjustment (4), disconnect cable from backing plate and actating lever (3) remove rear wheel.



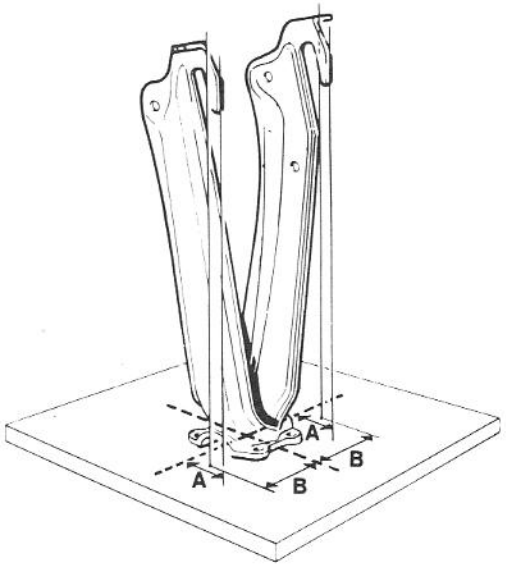
Remove lower shock absorber mounting hardware.



REAR SWING ARM

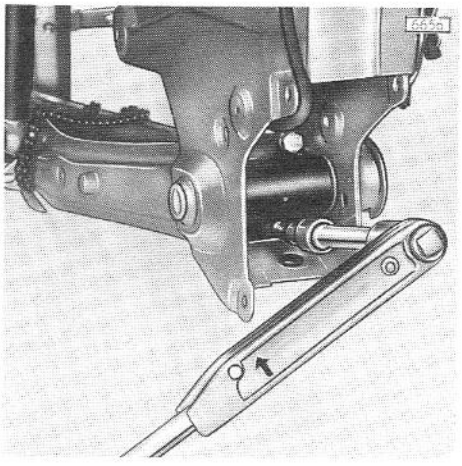


Remove the four (4) retaining bolts and remove bearing cup, rear fork and rubber bearing.



CHECKING THE SWING ARM

Fix bearing flange of swing arm on a straightening plate. As shown in figure, mark center line. The difference of the measurements shows the distortion of the swing arm.
If no difference is measured the swing arm bearing of the frame is distorted. A distorted frame cannot be aligned but must be replaced. Further, check swing arm rubber bush and both plastic bushes of pedal shaft.



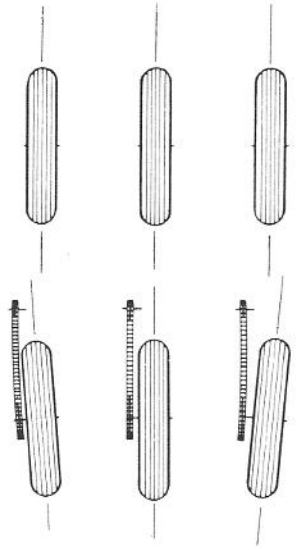
FITTING THE SWING ARM

Proceed in reversed order to dismantling.

NOTE: To prevent excessive pre-stressing (excess wear) of the rubber bearing the four (4) bearing cup bolts should only be torqued after mounting the shock absorbers.
Torque bearing cup bolts to 29 ft/lb (40 Nm).

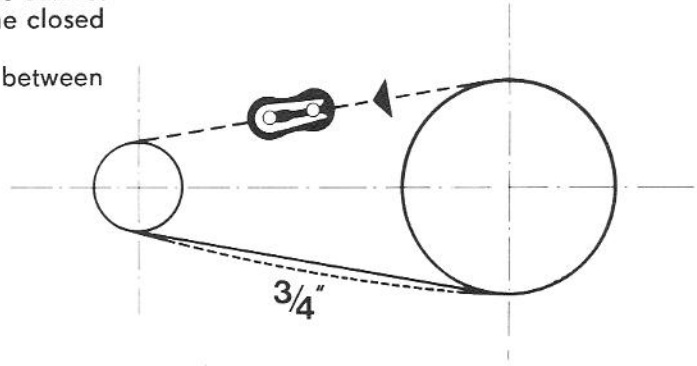
REAR WHEEL - BRAKES

When installing a rear wheel make sure that both wheels are in alignment. Checking and adjusting is easily carried out in any workshop. e.g. The rear wheel is aligned by sighting from the rear (drive side) sprocket up to the engine sprocket. These two sprockets must fall within the same plane. Take two sightings down the chain to avoid error.
NOTE: Do not sight down the chain with the master link on top, as it tends to distort the reading.



REAR WHEEL

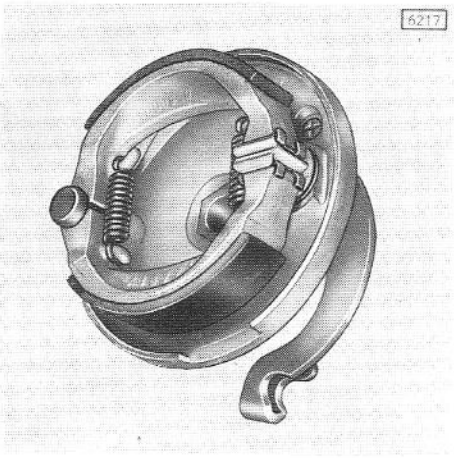
When refitting the chains take care that the tension is correct and the connecting links are properly placed with the closed end pointing in the direction of chain travel.
The designed slackness of the driving chain midway between the sprockets should be 3/4" (2 cm).

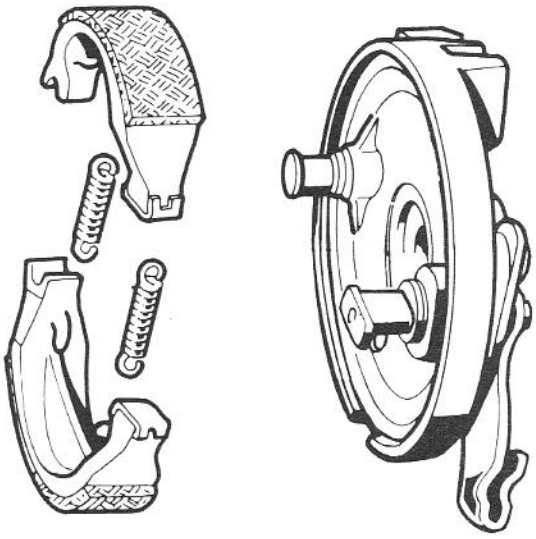


Bonded linings are used on all brake shoes fitted to our machines. If linings are worn, replace complete shoes.

Brake drum diameter	
New	Wear limit
3,149 in.	3,188 in.
80 mm	81 mm

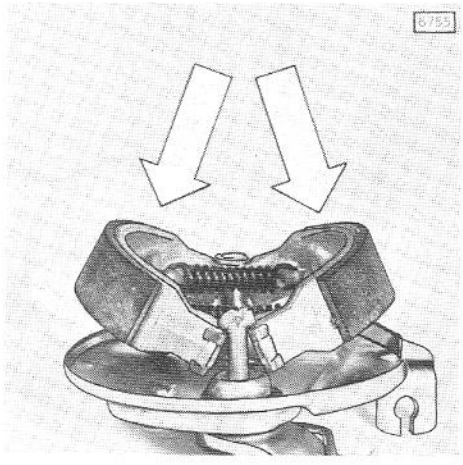
Diameter of fitted shoes	
New	Wear limit
3,110 - 3,129 in.	3,039 in.
79 - 79,5 mm	77,2 mm





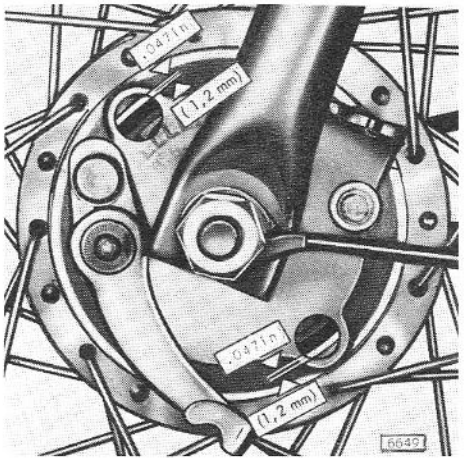
Replacing brake shoes

Pry brake shoes away from backing plate with a screw driver and remove shoes and springs.
Roughen brake surfaces of brake drums with emery cloth prior to fitting new shoes.
Oiled linings, usually due to over-greasing of brake cam, must be cleaned with gasoline or a similar degreasant.



MAG WHEELS

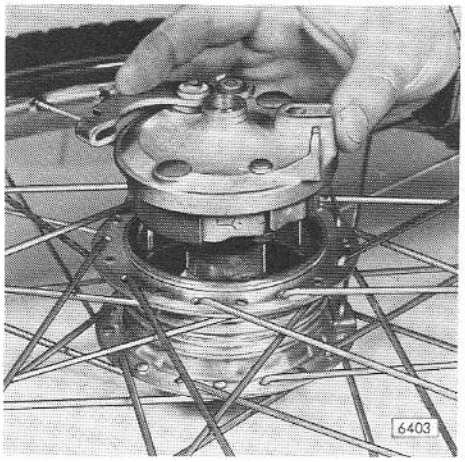
Install return spring with a screw driver after brake shoes have been positioned on backing plate.



Remove the inspection plugs and insert a flat feeler gauge between the brake drum and the brake lining. The gap should not exceed .047 in (1.2 mm) at either inspection hole. If it does, the brake linings must be replaced.
Disconnect cable before measurement is taken.

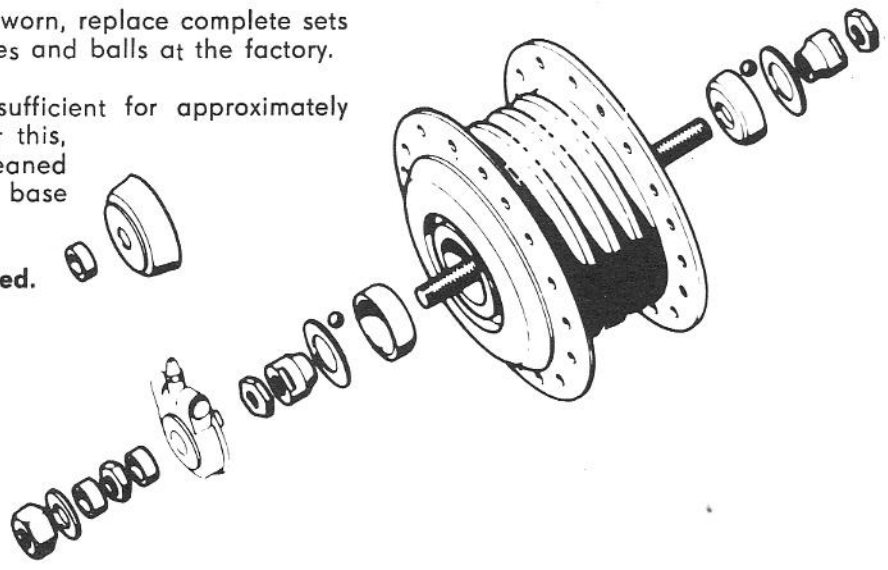
FRONT HUB (LELEU)

Remove lock nut and lift brake assembly out of hub.



If hubs with loose bearings are worn, replace complete sets consisting of bearing cups, cones and balls at the factory. Hubs are greased.
The original grease filling is sufficient for approximately 3600 miles (5800 km) use. After this, hubs must be dismantled, cleaned and regreased. Use lithium base grease.

Ball bearings are not caged. Do not lose any.

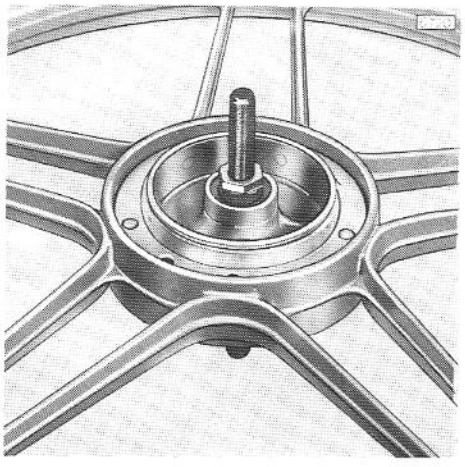


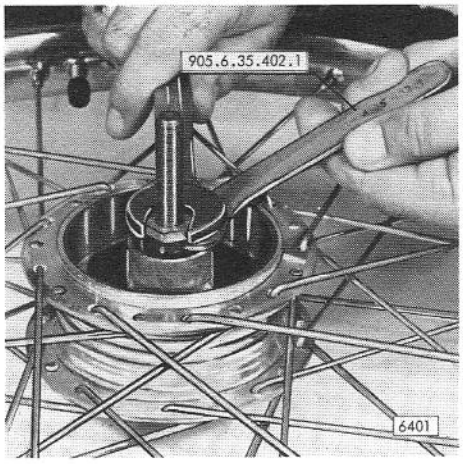
MAG WHEEL (FRONT)

Follow the same procedure as described with the spoke (LE-LEU) hub.

Brake drum diameter

New	Wear limit
3.149 in. (80 mm)	3.188 in (81 mm)

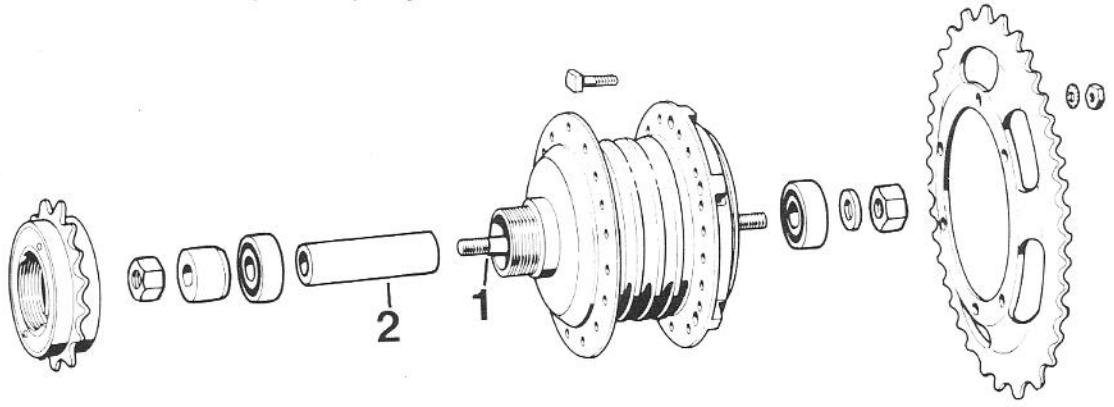


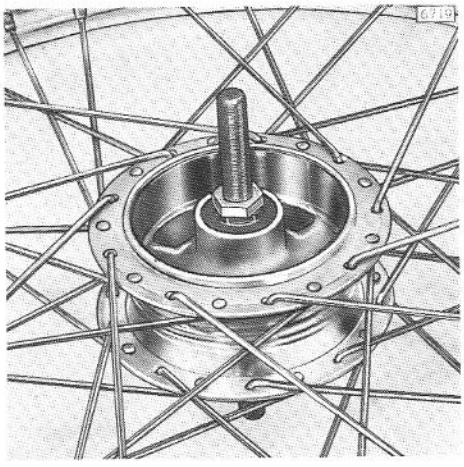


Use special spanner 905.6.35.402.1 to remove bearing cone and remove axle from hub.
Check cones and balls if pitted or damaged and replace if necessary. Old cups may be drifted out, new cups pressed in.

REAR HUB

The rear wheel uses two caged bearing sets, instead of the adjustable wheel bearings used on the front wheel and therefore do not require any adjustments.





Proceed with bearing removal/installation as follows:
a) Remove rear wheel, lift brake backing plate off hub and pull axle out towards brake drum.
b) Push bearing spacer (2) to the side to partially clear inner bearing race inside the hub.
c) Use punch to knock out one bearing at a time.

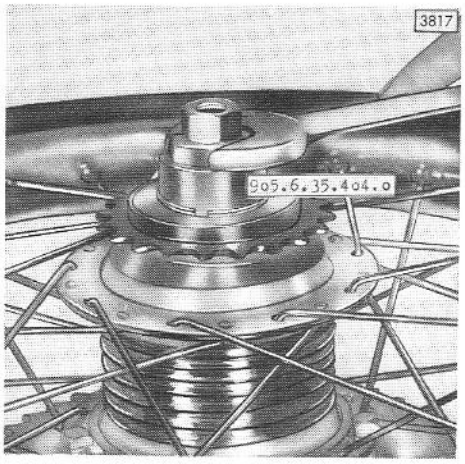
Bearing installation steps are:
a) Press one bearing into hub insert spacer tube and press in other bearing.
b) Insert axle from brake drum side, install brake backing plate and wheel.

NOTE: Ensure that wheel bearings are installed with the covered side facing outward.

IDLER GEAR - DRIVE SPROCKET

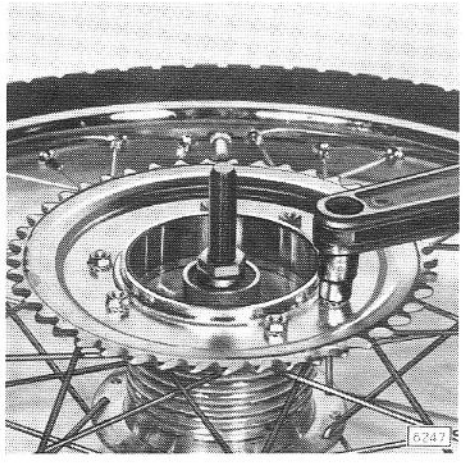
IDLER SPROCKET

It is not necessary to dismantle complete hub to replace idler sprocket. Unscrew complete sprocket with special tool 905.6.35.404.0 and replace if required.

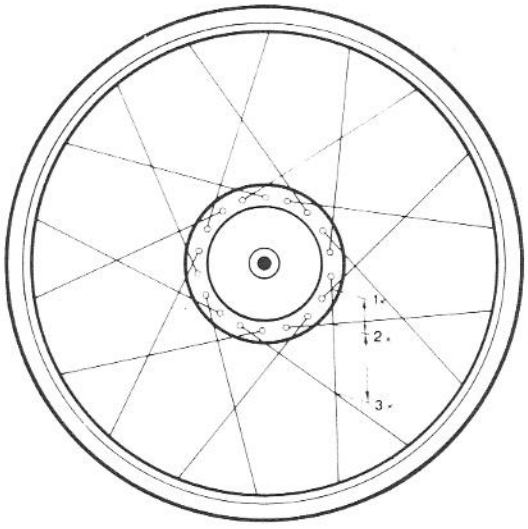


DRIVE SPROCKET

To replace drive sprocket remove mounting bolts and replace if required.
Torque nuts to 7 ft/lb (10 Nm).

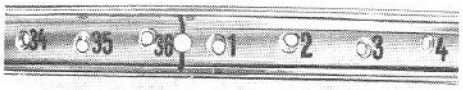


SPOKING WHEEL



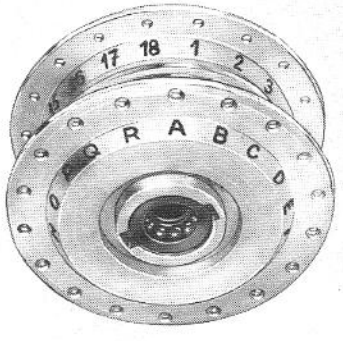
SPOKING WHEELS

Respoking requires the knowledge of correct sequence of the spokes in hubs and rims. Spokes of our models are 3 times crossed, that is, each spoke crosses 3 other spokes. The correct spoking procedure is outlined as follows.



A. Front wheel:

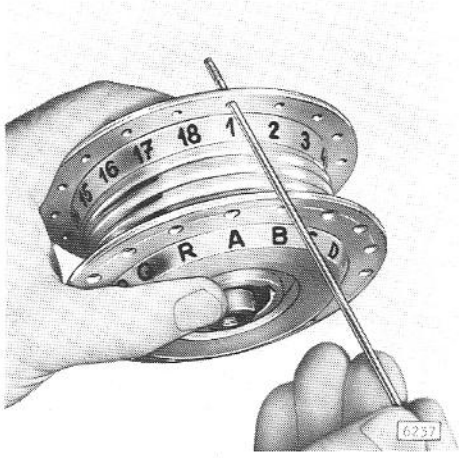
Marking of hub and rim.
Rim: Mark all spoke holes on the rim, starting with no. 1, next to the valve hole, up to 36 in the right hand direction (clockwise).



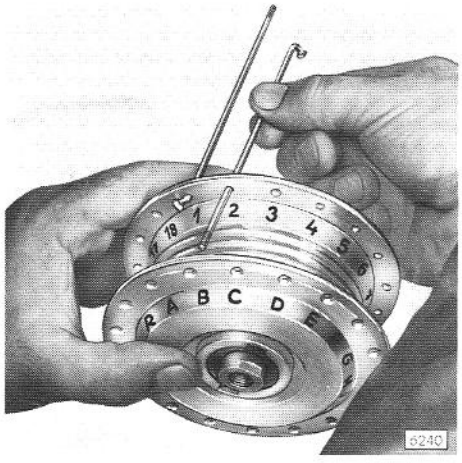
Hub: The brake drum facing downward, mark the lower spoke holes (brake drum side) from 1 to 18 in the right hand direction (clockwise). (See fig.).
Mark the upper spoke holes (opposite brake drum), starting with A to R in the right hand direction (clockwise). (See fig.)
NOTE: The upper hole marked A must be just to the left of the lower hole marked 1.

Installing spokes into hub

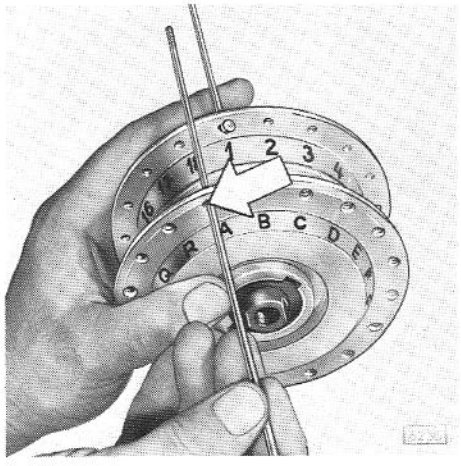
With the brake drum side again facing downward, install the first spoke into the hole marked 1 (lower hub flange) from the top down.



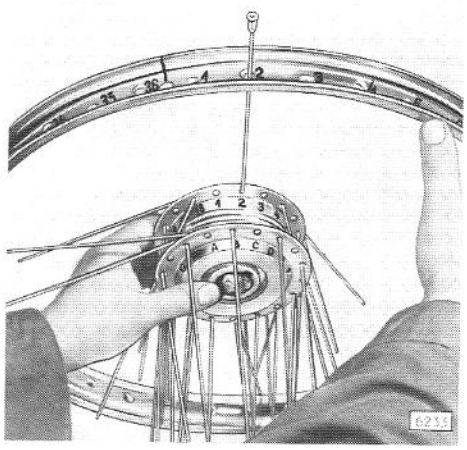
The second spoke is installed into hole marked 2 on the brake drum side of the hub from the bottom up. Continue to install all spokes on brake drum side with the next spoke into hole number 3 from top down, the next into hole 4 from the bottom up. Continue this sequence till all spokes are installed on the brake drum side.



With the brake drum side, the hub still facing downward, install the upper spokes in the spoke holes. Starting on the hole marked A insert the first spoke from the top down (see arrow).
The next spoke from the bottom up into hole marked B. Continue this sequence till all spokes are installed in the upper hub flange.



SPOKING WHEEL

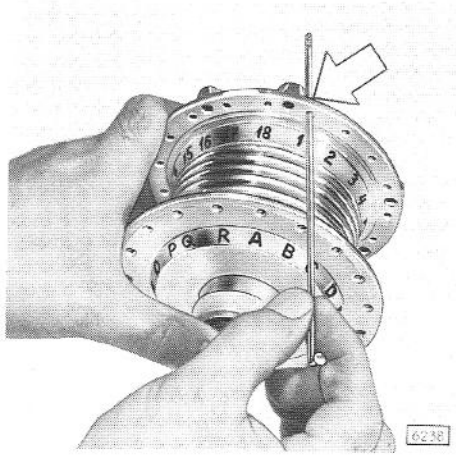


Place the marked rim in the upright position, so that the numbers on the marked rim holes increase to the right (clockwise).

Hold hub with spokes in the center of rim, brake drum facing away, and insert spoke marked 2 on the hub into rim hole marked 2. Place nipple a few turns on spoke thread, then continue to insert spokes in rim the following sequence.

NOTE: It is important that all spokes located on the inside of the hub flanges are installed in the rim first.

Spoke	A	in rim hole	11	Spoke	B	in rim hole	1
Spoke	4	in rim hole	6	Spoke	3	in rim hole	16
Spoke	C	in rim hole	15	Spoke	D	in rim hole	5
Spoke	6	in rim hole	10	Spoke	5	in rim hole	20
Spoke	E	in rim hole	19	Spoke	F	in rim hole	9
Spoke	8	in rim hole	14	Spoke	7	in rim hole	24
Spoke	G	in rim hole	23	Spoke	H	in rim hole	13
Spoke	10	in rim hole	18	Spoke	9	in rim hole	28
Spoke	I	in rim hole	27	Spoke	J	in rim hole	17
Spoke	12	in rim hole	22	Spoke	11	in rim hole	32
Spoke	K	in rim hole	31	Spoke	L	in rim hole	21
Spoke	14	in rim hole	26	Spoke	13	in rim hole	36
Spoke	M	in rim hole	35	Spoke	N	in rim hole	25
Spoke	16	in rim hole	30	Spoke	15	in rim hole	4
Spoke	O	in rim hole	3	Spoke	P	in rim hole	29
Spoke	18	in rim hole	34	Spoke	17	in rim hole	8
Spoke	Q	in rim hole	7	Spoke	R	in rim hole	33
Spoke	1	in rim hole	12				



B. Rear wheel:

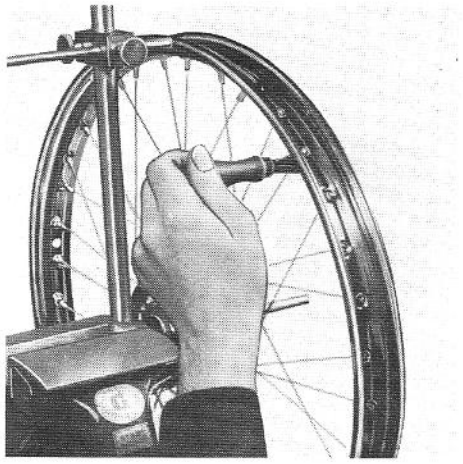
The spoking of the rear wheel follows the same procedure as outlined for the front wheel except when marking the spoke holes on the lower hub flange (brake drum side facing downward). It is very important to start with number 1 to the right hand side of a drive sprocket mounting hole.

See arrow. If this is not correctly marked the spoking cannot be carried out in the correct manner and there is insufficient space for the drive sprocket mounting bolts.

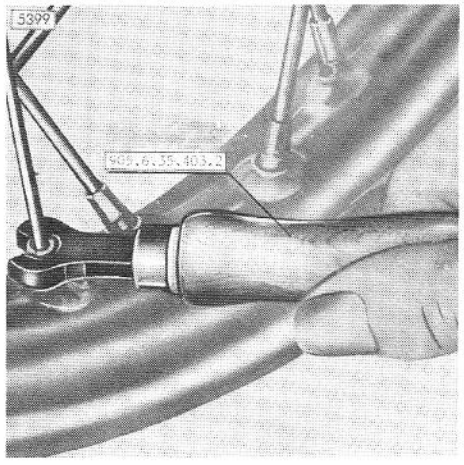
BALANCING

WHEEL TRUEING

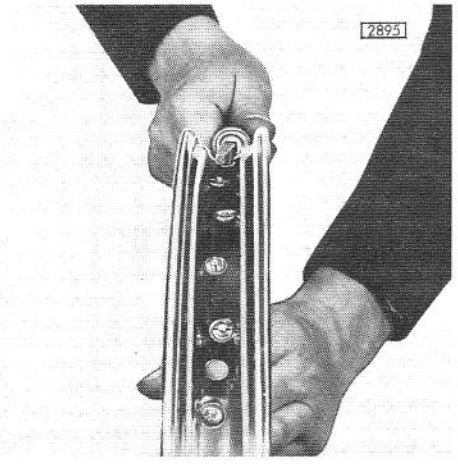
To true a wheel use device such as an old fork having adjustable pins opposite rim ends.
If the gap between adjustable pin or pins and circumference of rim remains the same, the wheel is running true.



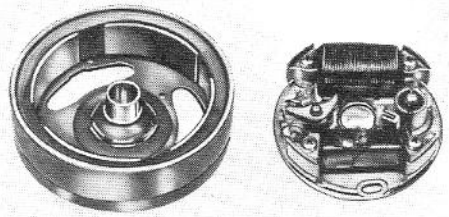
Apart from lining up rim and hub center, trueing a wheel also includes correction of any twist of rim by retensioning certain spokes. If unsuccessful, loosen counter acting spokes a little. A strongly tensioned wheel can often be trued by reducing the tension of the appropriate spoke a little providing the twist is only slight. Always start tensioning and loosening on the part having the biggest twist commencing alternatively to either side. The following spokes are loosened or tightened to a lesser extent. It is usually not possible to true the rim welding.
The special key, no. 905.6.35.401.2 can be used for the trueing of wheels.



After trueing remove all spoke ends extending beyond nipple heads. Even fractionally protruding spokes will damage the tube. Therefore, any burrs must be filed or ground down. It is recommended that all respoked wheels be retrued after a few hours' riding. Spokes often settle during the first few hours of operation.



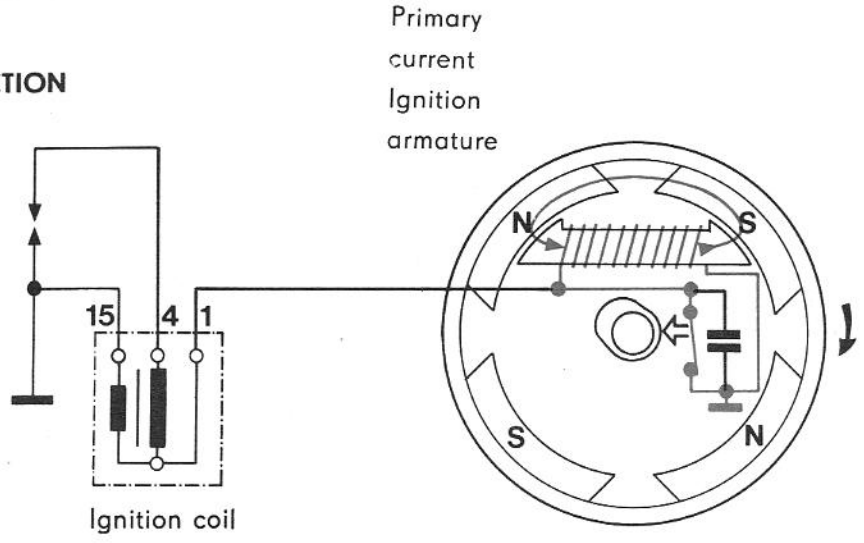
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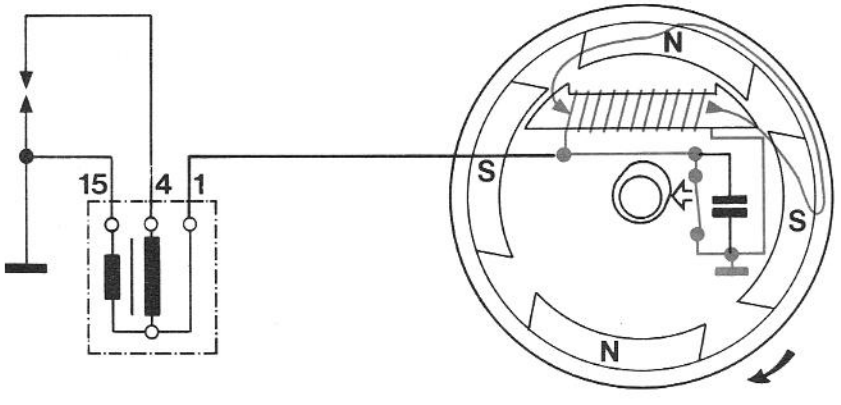
FLYWHEEL MAGNETO

Consists of the base plate assembly and the flywheel.

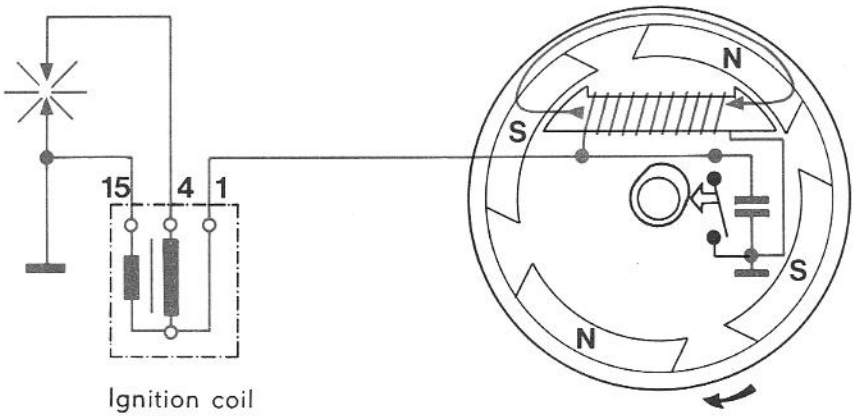
IGNITION FUNCTION



As the flywheel turns, a large number of reverses of magnetic flux is induced in the primary current ignition armature. When the breaker points are closed, as in illustration one, an induced current flows in the ignition armature of the magneto.



In illustration two the current in the ignition armature is at its greatest value.

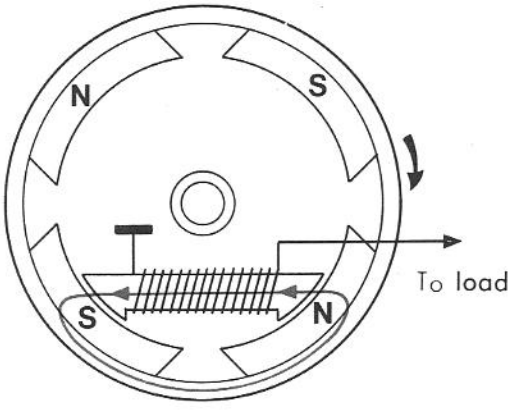


Ignition coil

At that point the contact points open and the magnetic flux in the armature core immediately reverses direction, sending current from the magneto armature to the primary side of the external ignition coil. This induces a high voltage in a secondary winding of the ignition coil, which generates a spark at the spark plug electrode.

NOTE: The condenser connected parallel to the contact breaker, prevents the formation of a spark at the breaker contacts.

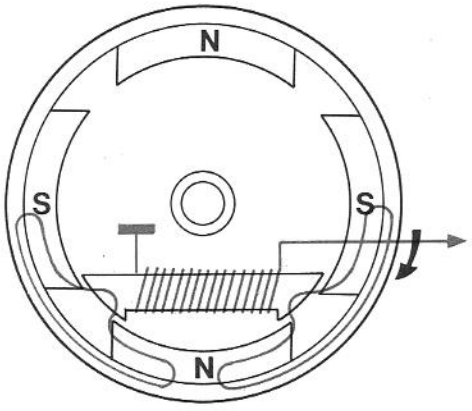
LIGHTING FUNCTION

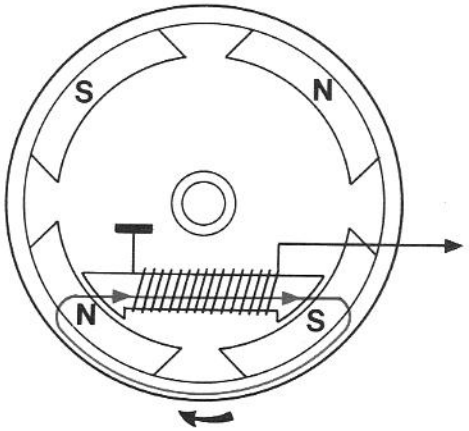


Generator armature

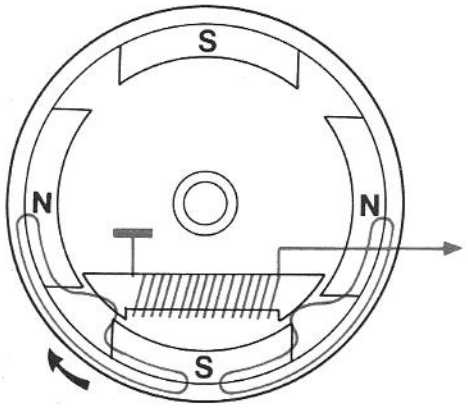
LIGHTING FUNCTION

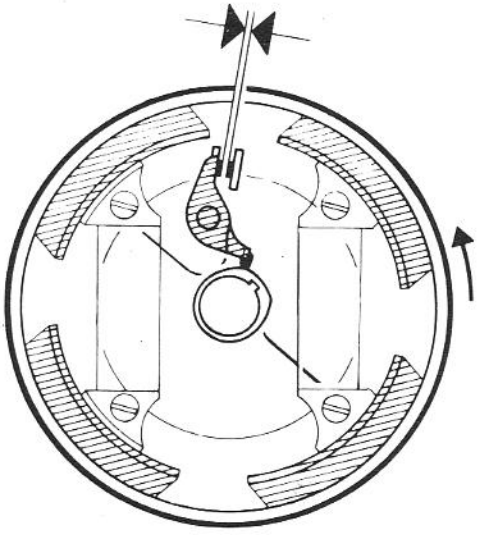
The magnetic flux, generated by the flywheel, also passes the lighting coil. The flywheel and lighting coil together form an alternating - current generator .i. e. with the flywheel rotating and the circuit closed (bulbs being switched on) alternating current will flow thru the lighting coil windings The lamp voltage is regulated automatically by the reaction of the alternating current to the magnetic flux of the flywheel and the voltage drop in the lighting coil winding.





This automatic regulation prevents the bulbs from burning out at both low and high engine revolutions. However, the automatic regulation is only effective if the specified load is being adhered to, i. e. if bulbs with specified voltage and capacity are used.



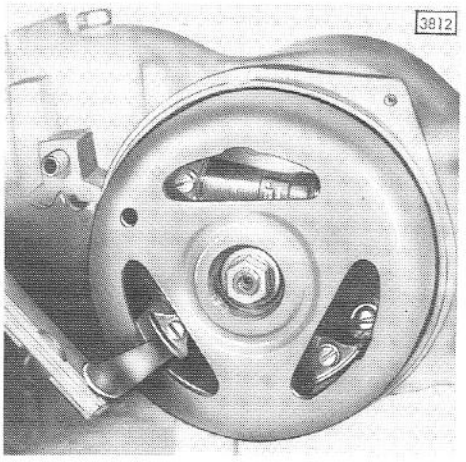


Breaker points gap

Burned or worn breaker points must be replaced with new ones.
Turn flywheel until the fully opened breaker contacts are visible thru the recess in the flywheel.
Since breaker points wear after operation and the gap reduces, the gap of new points should be adjusted to at least:
0.14 – 0.18 in. (0,35 mm – 0,45 mm) for 1 speed- and
0.16 – 0.20 in. (0,40 – 0,50 mm) for 2 speed engine.

BREAKER POINTS

If lighting coil/s has/have been replaced, measure air gap between coil pole shoes and flywheel. Gap should be .016 - .024 in. (0,40 - 0,60 mm). If gap is incorrect, loosen coil mounting screws and adjust as necessary.



Always check and adjust ignition timing if flywheel has been removed.

Coil resistances in ohms:

Tail lamp	6,7
Stop lamp	1,16
Head lamp	0,23

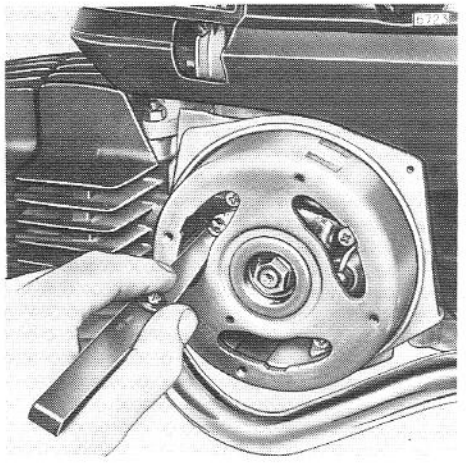
Ignition coil:

Primary	2
Secondary	5,4

Adjusting breaker points

Rotate flywheel until fully opened point gap is visible thru flywheel port. Loosen fixing screw and adjust point gap to

.014 – .018 in. (0,35 – 0,45 mm) 1-speed engine
.016 – .020 in. (0,40 – 0,50 mm) 2-speed engine



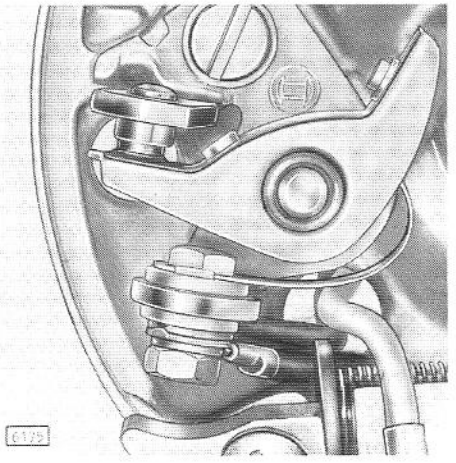
Replacing the breaker points

As already mentioned, points must be replaced if

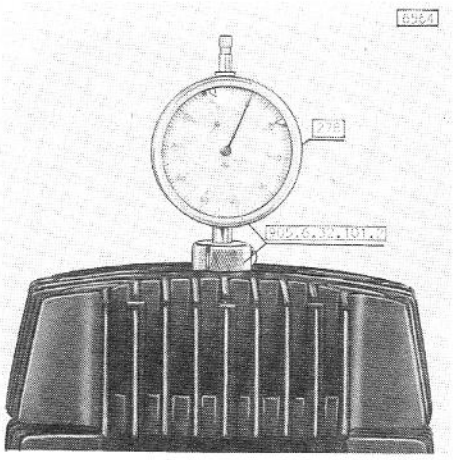
a) They are burned or worn
b) Fiber block is worn or loose
c) Bearing bush is worn or loose
d) Spring is loose
e) Fixed contact or moving contact are bent.

Unscrew cable at the breaker and remove fixing screw. Replace point set.

When fitting new points be sure the contact surfaces are free from grease or oil.



IGNITION TIMING

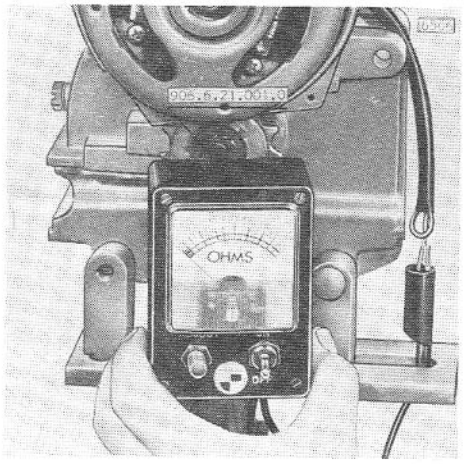


IGNITION TIMING

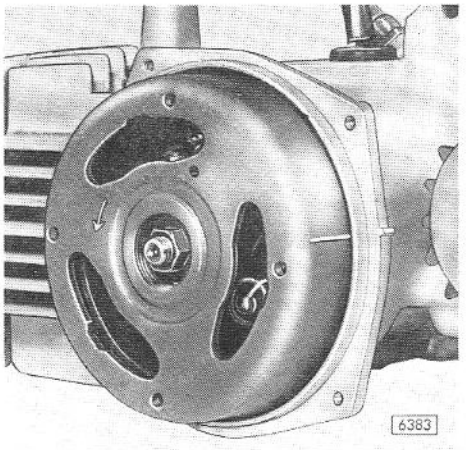
The engine output depends on correct ignition timing. Too far advanced ignition causes the engine to knock and too far retarded ignition reduces output. In both cases the engine overheats. Checking and adjusting the ignition:
Adjusting

Necessary for proper adjustment:

1 Dial indicator part no. 278
1 Puch low scale Ohmmeter 906.6.21.001.0



a) Remove spark plug
b) Screw adaptor with dial indicator into plug hole
c) Connect one cable of Ohmmeter to the blue wire and the other to ground



Turn flywheel to find TDC of piston travel and zero gauge. Turn flywheel opposite normal rotational direction (opposite arrow on flywheel)

1-speed .032 – .047 in. (0.80 – 1.20 mm)
2-speed .051 – .067 in. (1.30 – 1.70 mm)

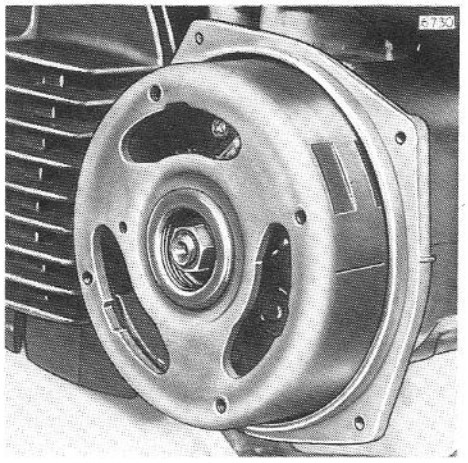
A needle movement of the Ohmmeter should indicate the points are opening within this tolerance. If the tolerance is not achieved the timing is incorrect.
Re-check breaker point gap or re-adjust till the correct ignition timing is achieved, providing the base plate assembly has been correctly installed.

IGNITION TIMING

ENGINE ROTATION

1 speed:

Engine rotation and ignition timing marks on flywheel and crankcase. Engine rotates to the right (clockwise).

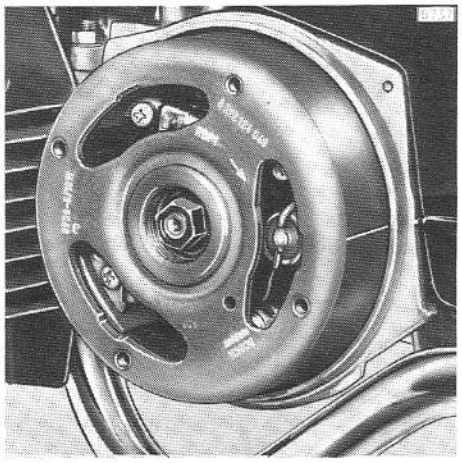


2-speed:

Engine rotation and ignition timing marks on flywheel and crankcase. Engine rotates to the left (counter-clockwise).

Fitting new flywheel (without timing mark):

Adjust breaker point gap to correct setting. To find T.D.C. of piston travel, insert a dial indicator into the plug hole (with holder). Find T.D.C. zero dial indicator and turn engine (.031 - .047 in. = 0,8 - 1,2 mm 1-speed engine and .051 - .067 in. = 1,3 - 1,7 mm 2-speed engine, measured on the dial indicator) backward (against engine direction) and mark flywheel in line with the timing mark on the housing. This is ignition timing mark. Re-check ignition as described on previous page.



ADJUST IGNITION TIMING WITH UNMARKED FLYWHEEL (without dial indicator)

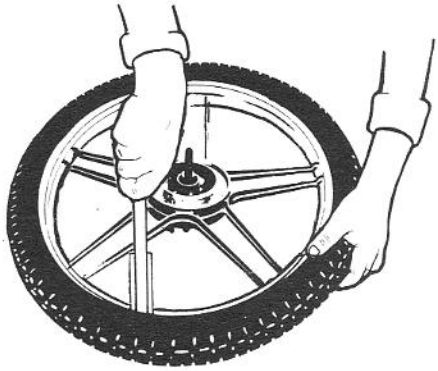
Adjust breaker point gap to correct setting. Find T.D.C. of piston travel (insert a drift into plug hole). Make a pencil mark on the flywheel at the parting line of the two housing halves (1 speed engine) or raised timing mark on housing with 2-speed engine. From that pencil mark measure .728 - .827 in. = 18,5 - 21,0 mm, for 2-speed-engine and .630 - .709 in. = 16 - 18 mm for 1-speed-engine forward on flywheel (in engine direction) and mark the flywheel. This is ignition mark. Re-check ignition timing as described on previous page.

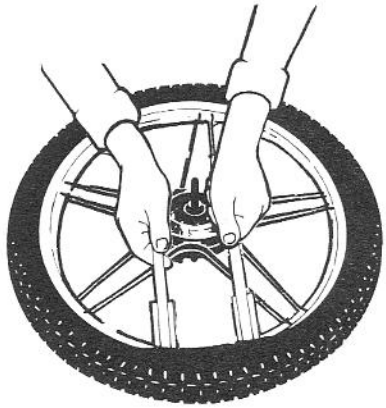


TIRE FITTING

TIRE CHANGING SCHEMATIC:

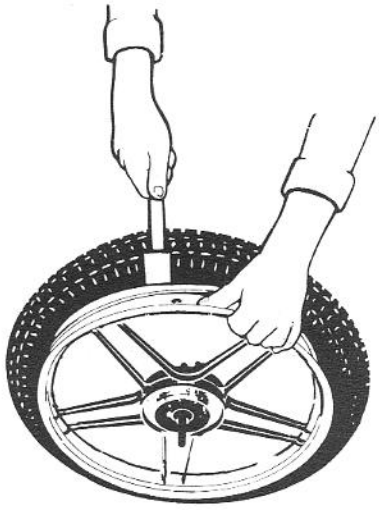
A

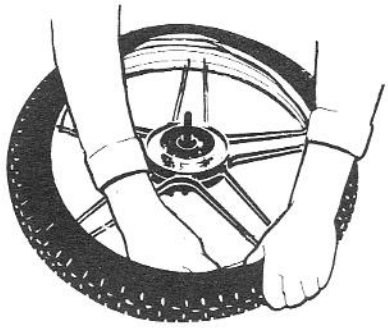




B

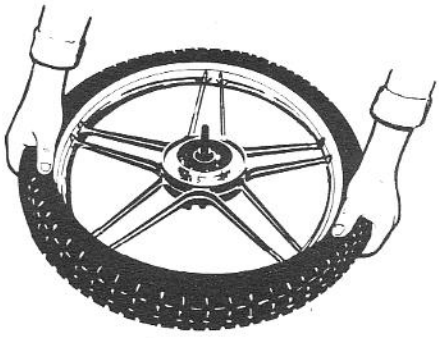
C

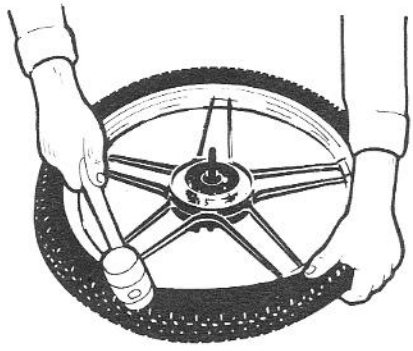




D

E





F

REMOVAL OF TIRE AND TUBE

⚠ It is essential when changing a tire to protect the aluminum rim from damage from the tire lever, Always use a leather or rubber strip between lever and the rim (fig. A, B and C).

TIRE MOUNTING

Place lightly pumped-up tube into tire and over the rim. But for the final stages of tire mounting use a rubber hammer to get tire over the rim (fig. F).

TROUBLE SHOOTING

ENGINE DOES NOT START OR IS HARD TO START

STEP 1 Ensure that on-off switch is in the on position

STEP 2 Check for fuel flow to carburetor

a. Depress primer button on carburetor and observe external fuel flow. If fuel flows, proceed to STEP 3.

If fuel does not flow:

b. remove fuel line from carburetor fitting, open fuel valve and watch for fuel flow. If fuel flows, proceed to STEP 4.

If fuel does not flow:

c. check fuel level in tank, if ok, clean tank and fuel valve filters.

d. attempt to start moped, if moped does not start, proceed to STEP 3.

STEP 3 Check for adequate spark.

a. Remove spark plug from cylinder head, place spark plug in the metal spark plug protector hold spark plug to ground on cylinder head and crank engine. Observe the spark – a crips blue color is normal – orange color indicates ignition malfunction.

Be sure that there is no fuel leakage before making an external ignition test.

If a good strong blue spark is evident, proceed to STEP 4.

Weak or no spark;

b. replace the spark plug with a know good spark plug, crank the engine, if spark occurs, attempt to start.

Weak or no spark;

c. unscrew the plug protector from the hi-tension wire, hold the wire end appr. 1 in. (2 - 3 mm) from ground and crank the engine. If spark occurs, replace the spark plug protector.

Weak or no spark;

d. remove the blue-black wire from the terminal block (magneto side) and connect the exposed end with the green-black wire in the terminal block. Crank the egine, if spark occurs, the problem lies in the horn circuit. Check the continuity of the blue-black wire through the harness to the horn switch. (The wire may be broken in the harness at the steering head area),

If spark does not occur:

remove the black wire(s) from the terminal block. Crank the engine, if spark occurs, replace the on-off switch.

If spark does not occur:

e. check magneto function;

1. remove the blue-black wire from the terminal block where it was joined with the green-black. Temporarily leave disconnected.
2. remove the blue wire from the hi-tension coil.

3. connect one lead of the Puch special point tester 9066220020 to the blue wire end, and the other lead to ground.
4. remove the flywheel dust cover and slowly rotate the flywheel in the indicated direction of rotation.
5. observe the ohmmeter for a full scale fluctuation of the indicator needle, a closed reading with no movement of the needle indicates;
   a. shorted points or condenser
   b. closed points (check condition of rubbiing block)
   an open reading with no needle movement indicate;
   a. open points
   b. very high point resistance
   c. broken blue wire

If full scale needle fluctuation is observed, check point resistance by rotating the flywheel until the needle fluctuates to the closed side of the scale, the reading should indicate in the red zone (less than .1 ohms resistance). With the needle in the closed position, remove the ohmmeter lead from ground and replace on the free end of the blue-black wire. The indicated reading will show ignition armature resistance (normal – .75 ohms).

REPAIRS:

1. closed points – adjust to specifications or replace if rubbing block worn
2. shorted points – check for shorts at attachment leads for internally shorted points – replace shorted condenser
3. open points – adjust to specifications
4. high point resistance – replace points (if blue and burned, replace condenser)
5. ignition armature resistance incorrect – replace armature.

After making any of the above repairs, retime the engine, and check for spark. If spark occurs, attempt to start the engine.

If spark does not occur:

check flywheel by cranking engine with light switch on, if headlight lights, flywheel is functional. If headlight does not light, replace flywheel.
Crank engine and check for spark. If spark occurs, attempt to start.

If spark does not occur:

replace the hi-tension coil with a know good one.

STEP 4 Timed spark occurs, fuel flows to carburetor, but the moped will not start;

a. check starter clutch function
b. check compression (cranking resistance)
c. crank engine to attempt start; if engine does not start, remove spark plug and examine condition

If wet, remove carburetor fuel bowl and check

a. fuel quality, i.e., (stale, water contamination, unknow liquid)
b. excess oil in gasoline
c. clogged air filter
d. main jet wrong size or loose in bowl

If plug is dry, remove carburetor fuel bowl and check

a. clogged main jet
b. stuck float or needle (no fuel in bowl)
c. clogged filter in banjo fitting

TROUBLE SHOOTING

OTHER COMMON COMPLAINTS	CORRECTION
1. Lack of power; limited top speed	
a. dragging brakes	adjust correctly
b. tight chain	adjust to specifications
c. under inflated tires	inflate to specifications
d. defective spark plug	replace
e. clogged air filter	clean on replace
f. clogged exhaust	de-carbon engine
	de-carbon pipe and baffle
g. choke not returing fully causing "4 stroking at top end"	ensure that throttle cable is opening the choke slide fully. If throttle opens fully, bend the choke tab down where it contacts the throttle slide.
h. low float level	adjust to specifications
i. main jet incorrect	if plug is burning black, decrease size
j. incorrect ignition timing	adjust to specifications

MALFUNCTIONS IN LIGHTING CIRCUITS

The Puch moped is equipped with an A. C. magneto. The ultimate power generated by each circuit is limited only by the load on each circuit; there is no means of voltage limitation other than the bulbs in the circuit. It is therefore of the utmost importance to utilize only the bulb specified for each circuit.

The following tests, it is assumed that you have in your possession a Puch low scale ohmmeter 906.6.21.001.0.

I. The Tail Lamp Circuit

The tail lamp circuit is powered by the grey wire coming out of the magneto. The magneto armature for the circuit is internally grounded. The correct bulb size is 6 Volt, 5 Watt.

The taillight circuit is unique in that its on-off function is **not** directly controlled by the lighting switch. It is controlled by the headlight armature being energized, and in turn, by induction, energizing the tail lamp armature. Bear in mind that because of the design of the circuit that the tail lamp cannot function without the head lamp.

TROUBLE SHOOTING: inoperative taillight

1. ensure that the head lamp is working
2. check the bulb, both for burn out and proper size
3. check for adequate ground utilizing the Puch ohmmeter.
4. check for continuity in the fender harness (wires may rub through)
5. check for tail lamp armature resistance
   disconnect the grey wire (magneto side) from the terminal block. Connect 1 lead of the ohmmeter to the grey wire and the other lead to ground. The correct resistance should be (6-7) ohms.

II. The Stop Light Circuit

The stop light circuit is powered by the solid greenwire coming out of the magneto. The green-black wire is the ground for the brake light armature. It connects with the brown wire in the terminal block. The correct bulb is 6 Volt, 10 Watts.

The stop light circuit is a simple continuity circuit controlled by two siwtches, one at each grip.

TROUBLE SHOOTING: inoperative stop light

1. check the bulb for burn out and for proper size.

2. check the ground circuit utilizing the Puch ohmmeter
3. check the switches utilizing the ohmmeter
   With the leads connected to the two terminals of the switch, the ohmmeter should indicate a closed circuit when the lever is pulled. If not, replace the switch.
4. continuity of the wire from the terminal block to the switches and to the rear lamp can be checked with the ohmmeter.
5. check the stop light armature by disconnecting the green lead from the terminal block, connect 1 lead of the ohmmeter to green and other to ground. The proper reading is 1-1,2 ohms.

III. The Headlight Circuit

The headlight circuit powered by the yellow wire coming out of the magneto. The headlight armature is internally grounded. The correct bulb is 6 V, 21 Watt.
Proper resistance in the lighting circuit is maintained by having BOTH the leadlight and speedometer bulbs operative in the circuit. If either bulb fails, it is certain that after a period of time, the other will fail.
When replacing a headlight bulb, be sure that the speedometer bulb is operative.
Accessory directional signal can be tied to the head lamp circuit. The easiest and neatest place to connect is at the head lamp switch at the terminal where the yellow wire comes in to the switch.

TROUBLE SHOOTING: inoperative headlight

1. check the bulb for burn out and for proper size.
2. check the switch by connecting the ohmmeter to the terminals at the back of the switch; one lead to the yellow wire and one lead to the yellow-black wire. With the switch turned on, the ohmmeter should indicate a closed circuit.
3. check the headlight armature by removing yellow from terminal block. Connect 1 lead of the ohmmeter to yellow and the other to ground. The reading should be .2 ohms.

TROUBLE SHOOTING

POOR PERFORMANCE

1. Ignition timing off – adjust ignition timing as per "Service Manual"
2. Brakes drag – adjust brake cables
3. Wrong cylinder/piston match – refer to sorting table on page 41
4. Throttle slide does not open fully – check throttle cable for damage (fryed) and/or adjustment. Check for faulty choke slide.

EXCESSIVE SMOKING

1. Wrong gas/oil mixture – a) drain fuel and fill tank with correct mixture, refer to "Technical Data" MAGNUM MK II, drain fuel and fill tank with pure gasoline only.
   b) replace defective right side crankshaft seal, refer to page 43, 69.

ENGINE RACING OR NO IDLE

1. Carburetor loose – push carburetor fully onto the intake pipe (manifold) and secure same on it.
2. Manifold loose – check vacuum leak on manifold flange or gasket. Tighten manifold to cylinder and/or replace flange gasket.
3. Leaking seal – replace defective seal on generator side.
4. Throttle stop – adjust engine idle speed with throttle stop screw. Ensure that preliminary adjustments, such as timing, throttle cable slack, have been carried out.

Shortcomings of the following nature may be found on the one- or two-speed automatic:

ENGINE MAY BE DIFFICULT TO CRANK

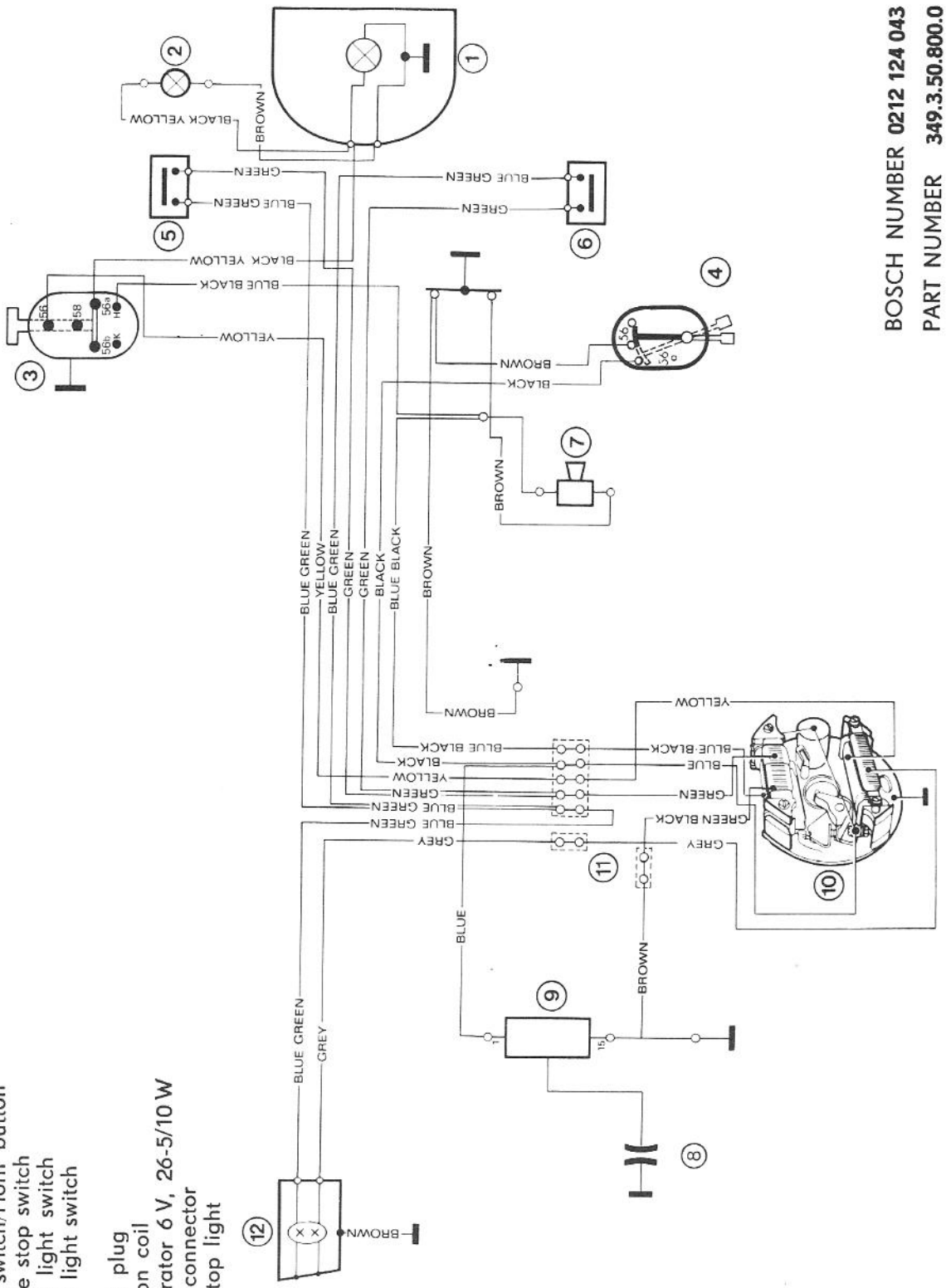
1. Starting clutch slips – a) adjust starter cable. One speed automatic refer to page 55. Two speed automatic refer to page 81.
   b) drain transmission oil and fill transmission with ATF "TYPE F". Visual check of the oil may not reveal if ordinary engine oil or ATF is filled.
   c) worn clutch lining, replace. The excessive wear of the clutch lining on the starting clutch is caused by improper adjusted starter cable or by applying clutch while riding machine.

Shortcoming which may occur on the two-speed-automatic:

TRANSMISSION SHIFTING

1. No neutral – seized bushing on the crankshaft/clutch drum, refer to page 64.
2. Does not shift into 2nd gear – defective free wheel on first gear, replace defective parts of freewheel Refer to page 77 for additional information.

WIRING DIAGRAM



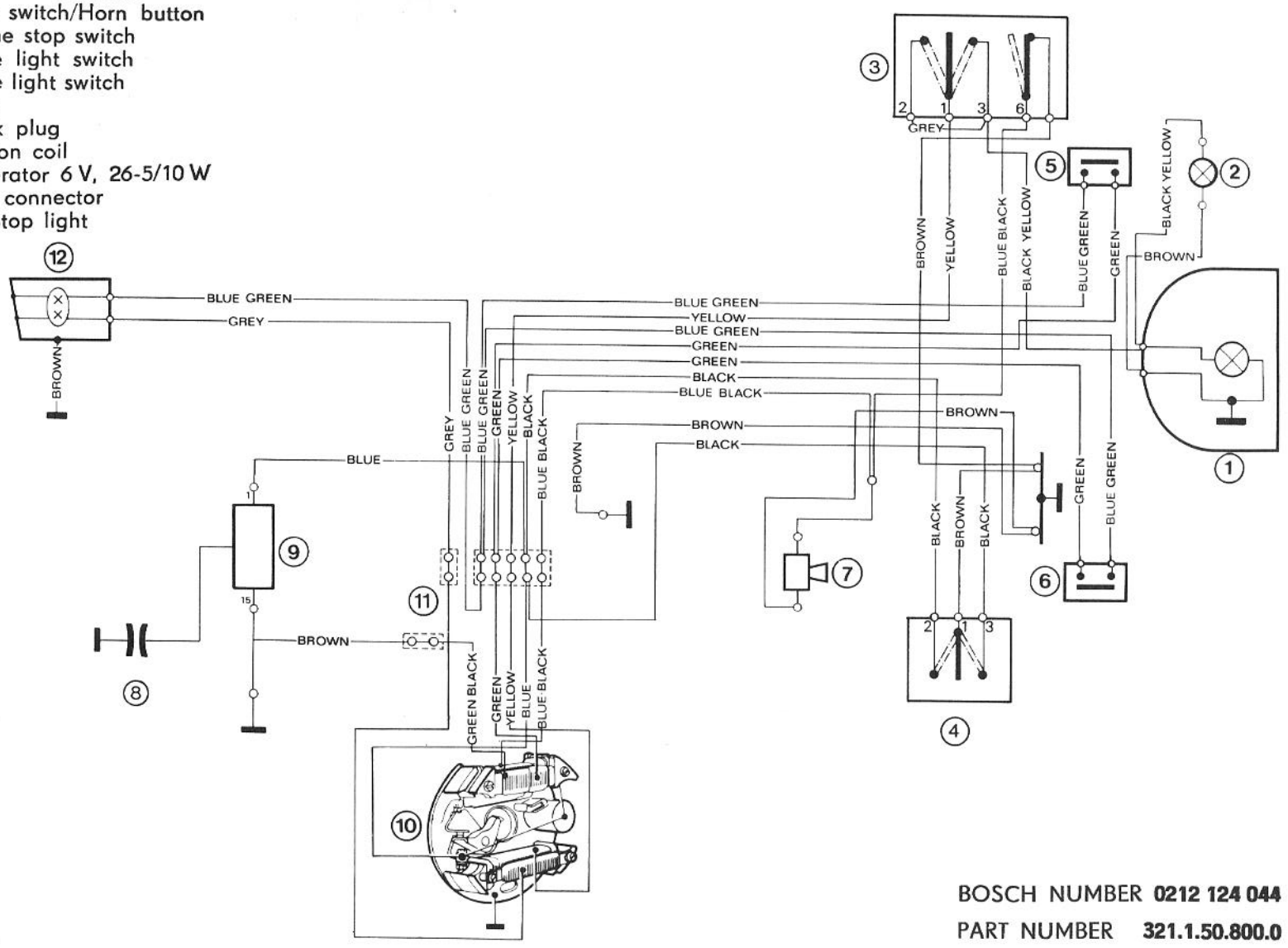
BOSCH NUMBER **0212 124 043**
PART NUMBER **349.3.50.800.0**

WIRING DIAGRAM – MAXI, MAXI LUXE

1) Headlamp
2) Speedometer bulb
3) Light switch/Horn button
4) Engine stop switch
5) Brake light switch
6) Brake light switch
7) Horn
8) Spark plug
9) Ignition coil
10) Generator 6 V, 26-5/10 W
11) Wire connector
12) Tail/Stop light

WIRING DIAGRAM – NEWPORT II, SPORT MK II

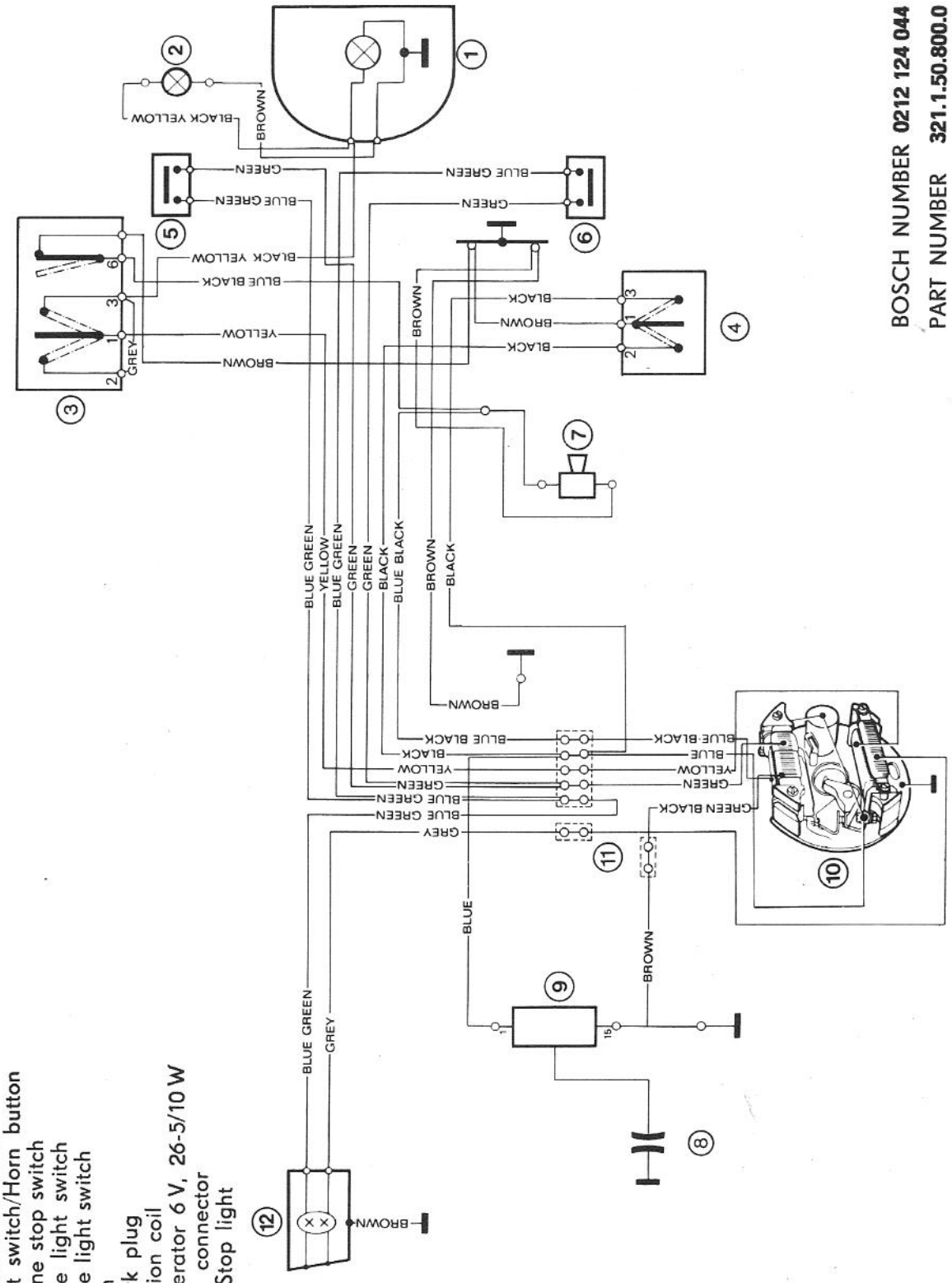
1) Headlamp
2) Speedometer bulb
3) Light switch/Horn button
4) Engine stop switch
5) Brake light switch
6) Brake light switch
7) Horn
8) Spark plug
9) Ignition coil
10) Generator 6 V, 26-5/10 W
11) Wire connector
12) Tail/Stop light



BOSCH NUMBER **0212 124 044**

PART NUMBER **321.1.50.800.0**

WIRING DIAGRAM



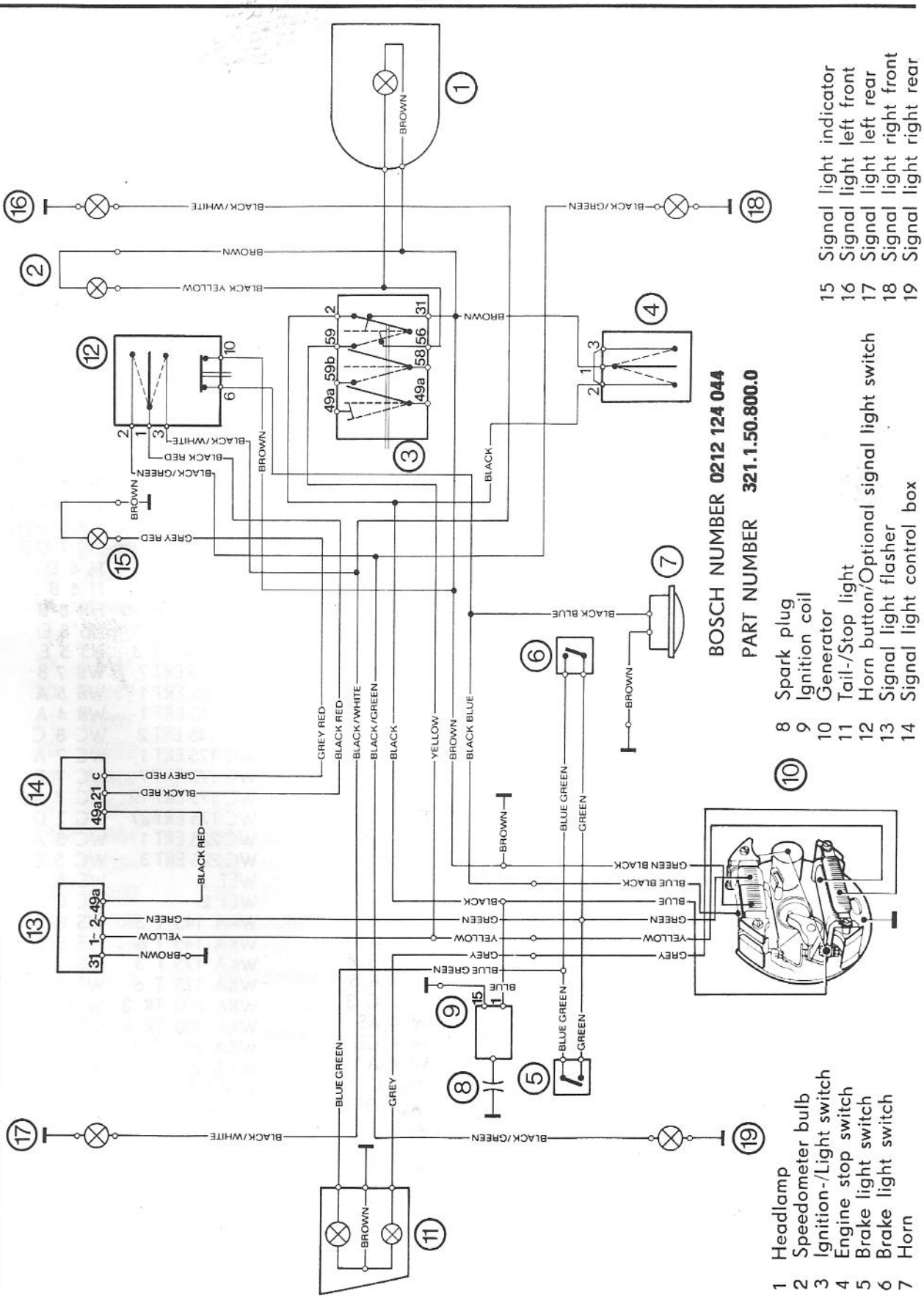
BOSCH NUMBER **0212 124 044**

PART NUMBER **321.1.50.800.0**

WIRING DIAGRAM – MAGNUM II

1) Headlamp
2) Speedometer bulb
3) Light switch/Horn button
4) Engine stop switch
5) Brake light switch
6) Brake light switch
7) Horn
8) Spark plug
9) Ignition coil
10) Generator 6 V, 26-5/10 W
11) Wire connector
12) Tail/Stop light

WIRING DIAGRAM



SPARK PLUG CONVERSION TABLE

KE/WB 225 F1	
M 45 T 1	M 12 B
M 95 T 1	M 10 A
M 95 T 5	M 10 A 0
M 145 T 1	M 8 A
M 145 T 5	M 8 A 0
M 175 T 1	M 7 A
M 225 P 11 S	M 5 AS
M 225 T 1	M 5 A
M 240 T 1	M 4 A 2
M 260 T 1	M 4 A 1
MA 95 T 1	D 10 A
MA 95 T 7	D 10 B
MA 95 TR 7	DR 10 B
MA 125 T 7	D 9 B
MA 125 TR 7	DR 9 B
MA 145 T 1	D 8 A
MA 145 T 7	D 8 B
MA 145 TR 7	DR 8 B
MA 175 T 1	D 7 A
MA 175 T 7	D 7 B
MAG 310 T 2 SP	–
MAG 340 T 2 SP	–
MB 225 ERT 1	MB 5 A
MC 20 ERT 11	MC 13 AP 0
MC 175 ERT 1	MC 7 A
MC 175 ERT 9	MC 7 A 0
MC 175 ERT 10	MC 7 AP
U 175 T 1	U 7 A
U 175 T 3	U 7 E
U 260 T 1	U 4 A
UET 2	UE C
W 45 T 1	W 12 A
W 95 T 1	W 10 A
W 95 T 2	W 10 C
W 95 T 3	W 10 E
W 95 T 6	W 10 F
W 95 T 30	W 10 D
W 95 TR 3	WR 10 E
W 95 TR 6	WR 10 F (Y)
W 125 T 1	W 9 A
W 125 T 2	W 9 C
W 125 T 3	W 9 E
W 125 T 4	W 9 A O
W 125 T 6	W 9 F
W 125 T 30	W 9 D
W 125 TR 2	WR 9 C
W 125 TR 3	WR 9 E
W 125 TR 4	WR 9 A 0
W 125 TR 6	WR 9 F (Y)
W 125 TR 30	WR 9 D (Y)
W 145 M 1	W 8 A 0
W 145 M 2	W 8 C 0
W 145 T 1	W 8 A
W 145 T 1,1	W 8 A
W 145 T 2	W 8 C
W 145 T 3	W 8 E
W 145 T 6	W 8 F
W 145 T 30	W 8 D
W 145 T 35	W 8 B
W 145 TR 2	WR 8 C
W 145 TR 3	WR 8 E
W 145 TR 6	WR 8 F
W 145 TR 30	WR 8 D
W 150 M 11 S	W 8 AS
W 175 M 30	W 7 D 0
W 175 T 1	W 7 A
W 175 T 2	W 7 C
W 175 T 3	W 7 E
W 175 T 6	W 7 F
W 175 T 30	W 7 D
W 175 T 35	W 7 B
W 175 TR 1	WR 7 A
W 175 TR 6	WR 7 F
W 175 TR 30	WR 7 D
W 175 Z 1	W 7 A 0
W 190 M 11 S	W 6 AS
W 200 P 1	W 6 BP
W 200 T 30	W 6 D
W 200 T 35	W 6 B
W 200 TR 30	WR 6 D
W 215 P 21	W 6 DP
W 215 T 30	W 6 D 1
W 225 T 1	W 5 A
W 225 T 2	W 5 C
W 225 T 3	W 5 E
W 225 T 30	W 5 D
W 225 T 35	W 5 B
W 225 TR 30	WR 5 D
W 230 T 30	W 5 D 1
W 235 P 21	W 5 DP
W 240 M 1	W 4 A 4
W 240 MZ 1	W 4 A 6
W 240 T 1	W 4 A 2
W 240 T 2	W 4 C 2
W 240 T 3	W 4 E 2
W 240 T 35	W 4 B 2
W 250 P 21	W 4 DP
W 250 T 1	W 4 A
W 250 T 2	W 4 C
W 260 M 1	W 4 A 3
W 260 MZ 1	W 4 A 5
W 260 MZ 2	W 4 C 3
W 260 S 1 S	W 4 AS
W 260 S 2 S	W 4 CS
W 260 T 1	W 4 A 1
W 260 T 2	W 4 C 1
W 265 P 21	W 3 DP 2
W 275 T 1	W 3 A
W 275 T 2	W 3 C
W 280 MZ 1	W 3 A 0
W 280 MZ 2	W 3 C 0
W 280 P 21	W 3 DP
W 280 S 1 S	W 3 AS
W 280 S 2 S	W 3 CS
W 280 T 30	W 3 D
W 300 MZ 2	W 2 C 0
W 300 T 1	W 2 A
W 300 T 2	W 2 C
W 300 T 30	W 2 D
W 310 S 1 S	W 2 AS
W 310 S 2 S	W 2 CS
W 340 S 1 S	W 08 AS
W 340 S 2 S	W 08 CS
W 370 S 1 S	W 07 AS
W 370 S 2 S	W 07 CS
W 400 S 1 S	W 06 AS
W 400 S 2 S	W 06 CS
WA 95 T 40	H 10 B
WA 95 TR 4	HR 10 A (Y)
WA 95 TR 40	HR 10 B (X,Y)
WA 125 T 40	H 9 B
WA 125 TR 4	HR 9 A (Y)
WA 125 TR 30	HR 9 D
WA 125 TR 40	HR 9 B (X)
WA 145 T 40	H 8 B
WA 145 TR 4	HR 8 A (Y)
WA 145 TR 40	HR 8 B (Y)
WA 175 TR 31	HR 7 D 0
WA 200 T 30	H 6 D
WA 200 T 40	H 6 B
WA 200 TR 40	HR 6 B
WAK 145 T 3	HS 8 E
WAK 225 T 3	HS 5 E
WB 175 ERT 7	WB 7 B
WB 225 ERT 1	WB 5 A
WB 240 ERT 1	WB 4 A
WC 145 ERT 2	WC 8 C
WC 175 ERT 1	WC 7 A
WC 175 ERT 7	WC 7 B
WC 175 ERT 19	WC 7 A 0
WC 175 ERT 27	WC 7 D
WC 225 ERT 1	WC 5 A
WC 225 ERT 3	WC 5 E
WET 1	WE A
WET 2	WE C
WKA 145 T 3	WS 8 E
WKA 145 T 6	WS 8 F
WKA 175 T 3	WS 7 E
WKA 175 T 6	WS 7 F
WKA 200 TR 3	WSR 6 E
WKA 200 TR 6	WSR 6 F
WKA 225 T 3	WS 5 E
WKA 225 T 6	WS 5 F
X 175 T 1	X 7 A
X 260 T 1	X 4 A
X 260 T 2	X 4 C
X 300 T 1	X 2 A
X 300 T 2	X 2 C

METRIC CONVERSION TABLE

MILLIMETERS TO INCHES

mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
.01	.00039	.41	.01614	.81	.03189	21	.82677	61	2.40157
.02	.00079	.42	.01654	.82	.03228	22	.86614	62	2.44094
.03	.00118	.43	.01693	.83	.03268	23	.90551	63	2.48031
.04	.00157	.44	.01732	.84	.03307	24	.94488	64	2.51968
.05	.00197	.45	.01772	.85	.03346	25	.98425	65	2.55905
.06	.00236	.46	.01811	.86	.03386	26	1.02362	66	2.59842
.07	.00276	.47	.01850	.87	.03425	27	1.06299	67	2.63779
.08	.00315	.48	.01890	.88	.03465	28	1.10236	68	2.67716
.09	.00354	.49	.01929	.89	.03504	29	1.14173	69	2.71653
.10	.00394	.50	.01969	.90	.03533	30	1.18110	70	2.75590
.11	.00433	.51	.02008	.91	.03583	31	1.22047	71	2.79527
.12	.00472	.52	.02047	.92	.03622	32	1.25984	72	2.83464
.13	.00512	.53	.02087	.93	.03661	33	1.29921	73	2.87401
.14	.00551	.54	.02126	.94	.03701	34	1.33858	74	2.91338
.15	.00591	.55	.02165	.95	.03740	35	1.37795	75	2.95275
.16	.00630	.56	.02205	.96	.03780	36	1.41732	76	2.99212
.17	.00669	.57	.02244	.97	.03819	37	1.45669	77	3.03149
.18	.00709	.58	.02283	.98	.03858	38	1.49606	78	3.07088
.19	.00748	.59	.02323	.99	.03898	39	1.53543	79	3.11023
.20	.00787	.60	.02362	1.00	.03937	40	1.57480	80	3.14960
.21	.00827	.61	.02402	1	.03937	41	1.62417	81	3.18897
.22	.00866	.62	.02441	2	.07874	42	1.65354	82	3.22834
.23	.00906	.63	.02480	3	.11811	43	1.69291	83	3.26771
.24	.00945	.64	.02520	4	.15748	44	1.73228	84	3.30708
.25	.00984	.65	.02559	5	.19685	45	1.77165	85	3.34645
.26	.01024	.66	.02598	6	.23622	46	1.81102	86	3.38582
.27	.01063	.67	.02638	7	.27559	47	1.85039	87	3.42519
.28	.01102	.68	.02677	8	.31496	48	1.88976	88	3.46456
.29	.01142	.69	.02717	9	.35433	49	1.92913	89	3.50393
.30	.01181	.70	.02756	10	.39370	50	1.96850	90	3.54330
.31	.01220	.71	.02795	11	.43307	51	2.00787	91	3.58267
.32	.01260	.72	.02835	12	.47244	52	2.04724	92	3.62204
.33	.01299	.73	.02874	13	.51181	53	2.08661	93	3.66141
.34	.01339	.74	.02913	14	.55118	54	2.12598	94	3.70078
.35	.01378	.75	.02953	15	.59055	55	2.16535	95	3.74015
.36	.01417	.76	.02992	16	.62992	56	2.20472	96	3.77952
.37	.01457	.77	.03032	17	.66929	57	2.24409	97	3.81889
.38	.01496	.78	.03071	18	.70866	58	2.28346	98	3.85826
.39	.01535	.79	.03110	19	.74803	59	2.32283	99	3.89763
.40	.01575	.80	.03150	20	.78740	60	2.36220	100	3.93700

METRIC CONVERSION TABLE

METRIC TO AMERICAN CONVERSION TABLE

MULTIPLY	by	to obtain
(LINEAR)		
Millimeters (mm)	.03937	Inches
Millimeters (mm)	.00328	Feet
Centimeters (cm)	.3937	Inches
Centimeters (cm)	.0328	Feet
(DISTANCE)		
Meters (m)	39.37	Inches
Meters (m)	3.28	Feet
Kilometers (km)	3281	Feet
Kilometers (km)	.6214	Miles
(AREA)		
Square Centimeters (cm^2)	.155	Square Inches
Square Centimeters (cm^2)	.001076	Square Feet
Square Meters (m^2)	10.76	Square Feet
(VOLUME)		
Cubic Centimeters (cc)	.06102	Cubic Inches
Liters (l)	61.02	Cubic Inches
(LIQUID CAPACITY)		
Liters (l)	2.113	Pints
Liters (l)	1.057	Quarts
Liters (l)	.2642	Gallons
Cubic Centimeters (cc)	.0338	Fluid Ounces
U. S. Gallons	1.2	Imperial gals.
Imperial Gallons	277.274	cu. in.
(WEIGHT)		
Grams (gm)	.03527	Ounces
Kilograms (kg)	2.205	Pounds
(OTHER)		
Newton Meters (Nm)	.723	Foot Pounds (Ft. Lbs.)
Kilometers/Liters (km/l)	2.352	Miles/Gallon (mpg)
Metric Horsepower (ps)	1.014	Brake Horsepower (bhp)

AMERICAN TO METRIC CONVERSION TABLE

MULTIPLY	by	to obtain
(LINEAR)		
Inches (in.)	25.4	Millimeters
Inches (in.)	2.54	Centimeters
Feet (ft.)	304.8	Millimeters
Feet (ft.)	30.48	Centimeters
(DISTANCE)		
Inches (in.)	.0254	Meters
Feet (ft.)	.3048	Meters
Miles (mi.)	1.609	Kilometers
(AREA)		
Square Inches (in. 2)	6.452	Square Centim.
Square Feet (sq. ft.)	929	Square Centim.
(VOLUME)		
Cubic Inches (cu. in.)	16.39	Cubic Centim.
Cubic Inches (cu. in.)	.01639	Liters
(LIQUID CAPACITY)		
Pints (pt.)	.4732	Liters
Quarts (qt.)	.9463	Liters
Gallons (gal.)	3.785	Liters
Fluid Ounces (fl. oz.)	29.58	Cubic Centim.
U. S. Gallons	1.2	Imperial gals.
Imperial gallons	4.537	Liters
Imperial gallons	277.274	cu. in
(WEIGHT)		
Ounces (oz.)	28.35	Grams
Pounds (lb.)	.4536	Kilograms
(OTHER)		
Foot-Pounds (ft. lbs.)	1.383	Newton Meters (Nm)
Miles/Gallon (mgp)	.4252	Kilometers/Liter (km/l)
Brake Horsepower (bhp)	.9862	Metric Horsepower (ps)

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