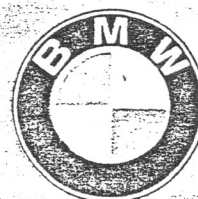
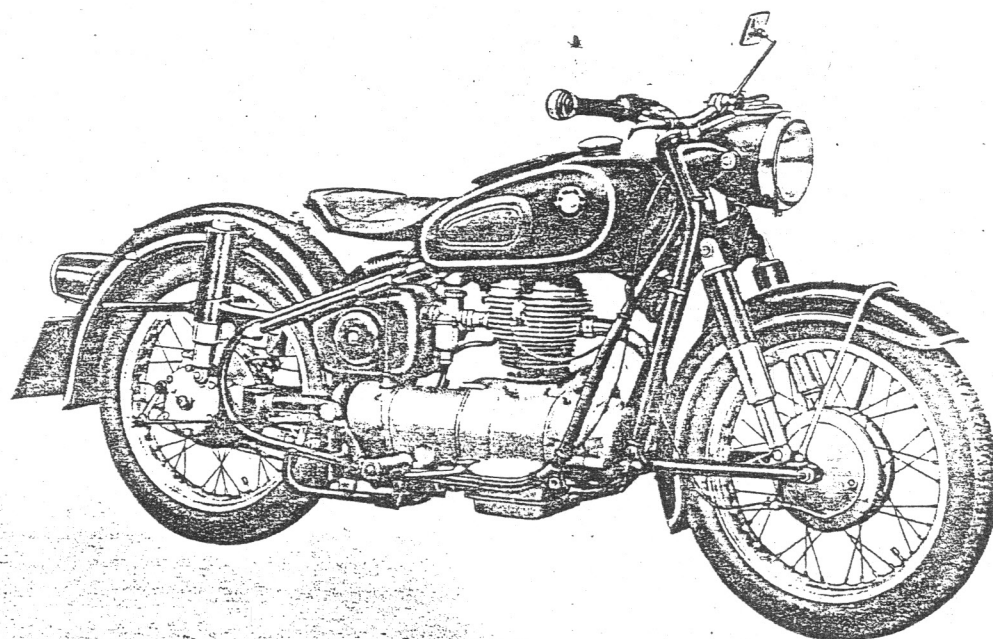


Instruction manual

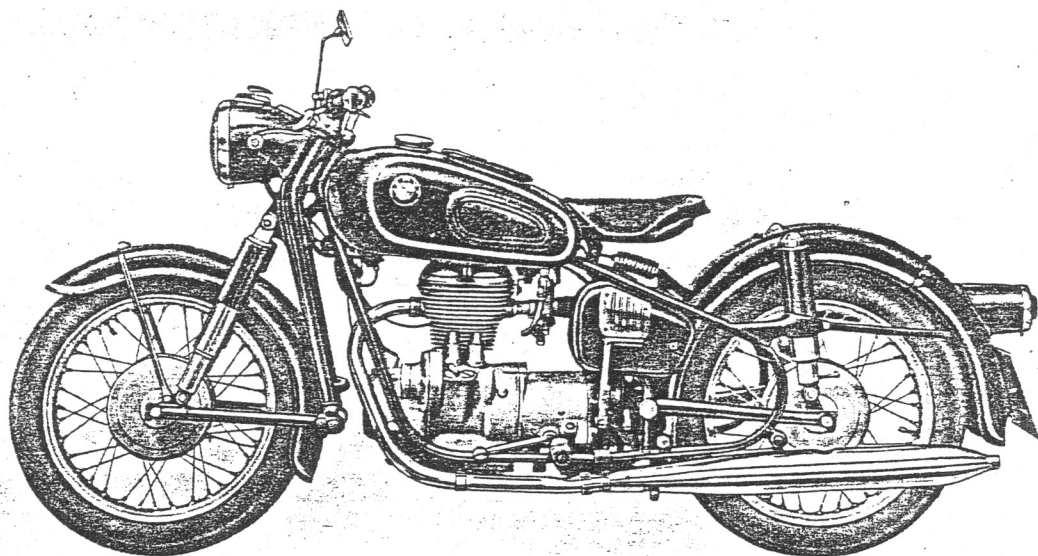
Motorcycle R 27



BMW R 27
with floating engine
Viewed from the right



BMW R 27
with floating engine
Viewed from the left



A Word to Owners 3

A Word to Owners

A new concept in motorcycling pleasure is now yours as the owner of the new R 27. All over the world, BMW products enjoy a unique reputation for their outstanding performance, reliability and long service life. The deep-rooted satisfaction of owning a fine motorcycle will find its greatest fulfillment in the ownership of a BMW motorcycle. And each day and mile of riding will increase your appreciation of the excellence of BMW performance.

Your BMW R 27 motorcycle with the floating engine incorporates the most advanced technical perfection based on 30 years' experience of motorcycle manufacture. The BMW engineering policy in the motorcycle field is one of continuous improvement of the excellent, well proven, basic conceptions—the clean, compact engine with longitudinal axis of rotation, the quiet, enclosed shaft drive and springing arrangement for superb road-holding—which have proved so outstandingly successful at scores of events in nearly every country, and in the establishment of new world records.

The R 27 design retains the well proven full swing arm suspension of the preceding model R 26, with the added advantage of far superior driving comfort through poised-power rubber engine mounts.

Horsepower and torque of the engine have been increased. The further technical particularities of your R 27 are thoroughly described throughout another chapter of this booklet.

To help you obtain the fullest enjoyment of your motorcycle and familiarize you with its many features, we have prepared this owners manual as a guide to better understanding of its operation. Read the manual carefully. It tells you things you should know about your new R 27. The care in operating your new motorcycle according to the instructions laid down in this manual will contribute greatly to longer life and add much to its future performance and economy of operation.

Be particularly careful to follow the "break-in" schedule for the running-in period and to have the appropriate service carried out at the suggested periods.

BMW service is always ready to assist you through a wide net of BMW Service Stations staffed with well trained personnel and equipped with the necessary special tools. All BMW dealers maintain an adequate stock of genuine BMW spare parts to solve any repair problem which may occur during the life of your R 27.

For the R 27 motorcycle, the factory has developed custom designed accessories (optional equipment), such as dual seat, prop stand, etc. Your BMW dealer will gladly inform you about these items. The BMW Dealer List given you with the motorcycle papers advises you where you can find the many dealers in the widespread chain of BMW Service Stations.

And now we wish you happy motorcycling with your BMW.

BAYERISCHE MOTOREN WERKE
Aktiengesellschaft

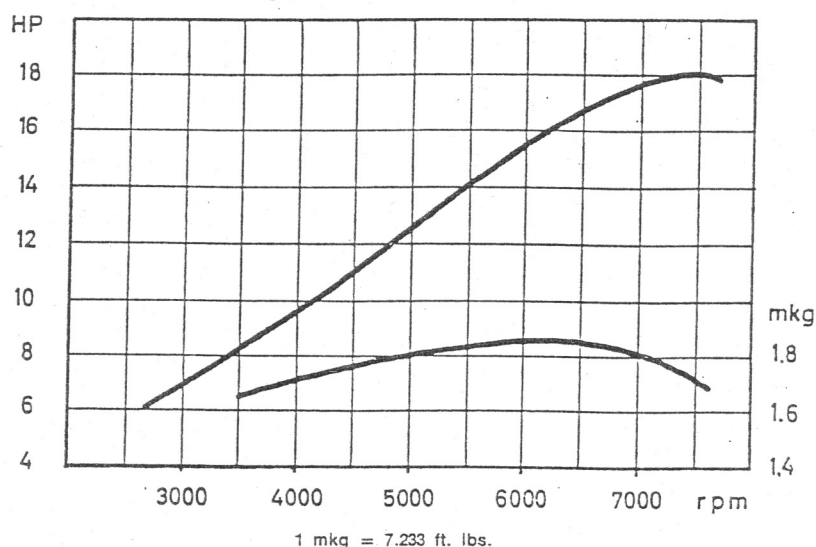
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6 Technical Data

Technical Data

Engine Power and Torque R 27



Engine:	Operation principle	Four-stroke cycle, valves overhead in V-arrangement
	Maximum brake horsepower	18 HP at 7400 rpm.
	Number of cylinders	1
	Cylinder arrangement	Vertical
	Bore	68 mm. (2.677")
	Stroke	68 mm. (2.677")
	Cylinder capacity	247 c.c. (15 cu. in.)
	Compression ratio	8.2 : 1
	Valve timing with 2 mm valve clearance:	Intake opens 4° BUDC
	(tolerance ± 2,5 deg.)	Intake closes 23° ABDC

Exhaust opens 43° BBDC
Exhaust closes 16° BUDC

Engine: (cont'd)	Valve clearance with engine cold (Running clearance):	
	Intake	0.15 mm. (.006")
	Exhaust	0.20 mm. (.008")
	Lubrication system	Pressure & Splash lubrication through gear-type pump, oil sump in bottom of engine housing
Carburetor:	Design	Throttle slide carburetor with accelerating pump
	Model	Bing 1/26/93
	Venturi	26 mm.
	Main jet	125
	Pump needle jet	45—291/1408/6
	Jet needle	46—255
	Needle adjustment	2
	Idle jet	35
	Pilot air screw opened	2 turns
	Throttle slide	22—540
	Weight of float	11 grams (.388 oz.)
	Carburetor air filter	Micronic dry filter
Electrical equipment:	Generator	Bosch LJ/CJE 60/6/1800 R 5
	Voltage regulator	Bosch 0 190 200 006
	Ignition coil	Bosch TJ 6/3
	Spark plug	Bosch W 240 T 1, Beru 240/14 or Champion L 85;
		Electrode gap 0.7 mm. (.0275")
	Electric horn	Bosch HF 6
	Battery	6 Volt/9 Ah.
	Ignition system	Battery ignition with automatic timing by centrifugal advance unit
	Contact breaker gap	0.4 mm. (.0157")
	Initial ignition timing	7° BUDC (Governor weights in initial position)
	Maximum advance	42° BUDC (Governor weights fully spread out)
Lamp Bulb Data:	Headlamp (High beam and Low beam)	6 V, 35/35 W, bilux lamp
	Pilot lamp (Parking lamp)	6 V, 2 W, indicator lamp
	Neutral indicator light	6 V, 2 W, indicator lamp
	Charge indicator light	6 V, 2 W, indicator lamp
	Speedometer dial light	6 V, 0.6 or 1.2 W, indicator lamp
	Tail and Stop light	6 V, 5/18 W, twin-filament lamp

8 Technical Data

Lamp Bulb Data: (cont'd)	License plate light	6 V, 5 W, spherical lamp
	Directional signal light	6 V, 18 W, strip lamp
Power Train	Clutch	Single plate dry disc clutch with disc spring
	Transmission	Four-speed type with sliding dog units, housing bolted to engine.
		Torsional vibration damping through resilient drive shaft
		Positive-stop boot control
	Gearshift	In transmission
	Gear ratios:	Overall-Solo Overall with sidecar
	First	5.33 : 1 23.90 : 1 27.72 : 1
	Second	3.02 : 1 13.58 : 1 15.70 : 1
	Third	2.04 : 1 9.17 : 1 10.61 : 1
	Fourth	1.54 : 1 6.93 : 1 8.01 : 1
	Torque transferring from transmission to rear wheel	Cardan shaft drive totally enclosed within the rear, righthand swinging arm, with elastic coupling and helical bevel gears in oiltight housing
Chassis:	Bevel gear ratios:	
	Solo	4.5 : 1 = number of teeth 27/6
	Side-car	5.20 : 1 = number of teeth 26/5
Chassis:	Frame	Double tube steel frame
	Front suspension	Bottom link swing fork with telescopic suspension units and double-acting oil damping
	Rear suspension	Swinging arm suspension with telescopic shock absorbers and double-acting oil damping
	Brakes:	Front and rear-wheel internal shoe brake
	Brake drum diameter	160 mm. (6.3")
	Width of brake lining	35 mm. (1.378")
	Braking area	194 sq. cm. (30.07 sq. in.)
	Rims	Steel drop-center rims 2.15 B × 18 (36 spokes)
	Tires (Tyres)	3.25—18
Dimensions:	Overall width solo	660 mm. (25.6")
	with BMW side-car	1520 mm. (59.8")
	Overall length solo	2090 mm. (82.5")
	with BMW side-car	2300 mm. (90.5")
	Overall height	975 mm. (38.4")
	Wheel base solo	1380 mm. (54.3")

Dimensions: (cont'd)	with BMW side-car	1405 mm. (55.2")
	Track (Tread)	
	BMW combination	1090 mm. (42.9")
	Saddle height	770 mm. (30.2")
	Ground clearance	115 mm. (4.5")

Weights:	SOLO	WITH SIDE-CAR
	Curb weight*)	162 kg. (356 lbs.)
	Allowable total weight**)	240 kg. (529 lbs.)
	Allowable wheel load, front	480 kg. (1058 lbs.)
	Allowable wheel load, rear	150 kg. (330 lbs.)
	Allowable wheel load, side-car wheel	240 kg. (529 lbs.)
	Maximum occupation including rider	120 kg. (264 lbs.)
	2 people	3 people
	*) Curb weight = weight of motorcycle supplied with oil, fuel and tools.	
	**) Allowable total weight = Curb weight + people and luggage load.	

Maximum recommended speeds:	Depend on the air resistance encountered according to size, position and clothing of rider.
	(For maximum allowable speeds to be observed during the running-in period see page 14.)
with run-in engine in miles per hour.	First Second Third Fourth
Solo	22 40 59 74
With side-car	15 31 46 56

Fuel and lubricants:	Fuel	Regular brand-name gasoline
	Lubricants	see Servicing Data, page 20
	Capacity of fuel tank	15 liters (3.3 Imp. gal. or 4 U.S. gal.)
	with reserve fuel supply of	1.5 liters (sufficient for 25 miles)
	Oil capacity, engine	1.25 liters (2.2 Imp. pints or 2.6 U.S. pints)
	Oil capacity, gearbox	0.65 liters (1.1 Imp. pints or 1.3 U.S. pints)
	Oil capacity, bevel drive	125 c. c. (1/4 U.S. pint)
	Fuel consumption according to DIN 70030:	72 m./Imp. gal. or 60 m./U.S. gal. at 56 mph.
	Oil consumption	approx. 2820—5650 m./Imp. gal. or approx. 2350—4700 m./U.S. gal.

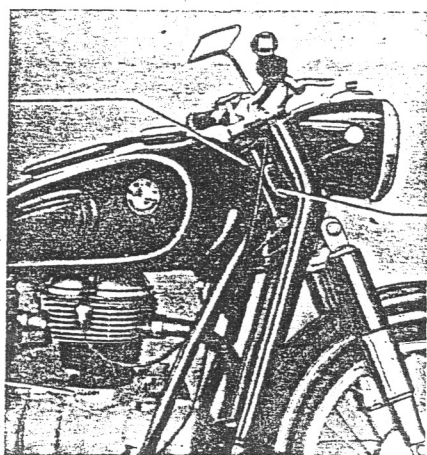
10 For Authorities

For Authorities

For Filling Stations

Frame and
Engine Numbers,
Serial Plate

372001



Fuel: Regular brand-name gas.

Capacity of fuel tank:
15 liters (3.5 Imp. gal. or 4 U.S. gal.) with
reserve fuel supply of 1.5 liters.

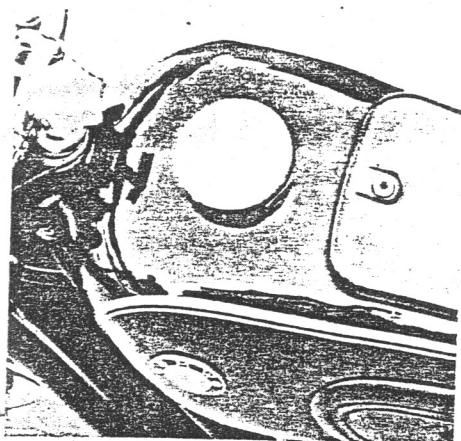
Lubrication of engine:
Brand name HD oils for Otto-cycle engines.

At outside temperatures of: Viscosity:
below 32 F° SAE 10 W 30
32—86 F° SAE 30

above 86 F° and for
sports driving SAE 40

Capacity: 1.25 liters (2.2 Imp. pints or 2.6
U.S. pints).

To check the oil level (initially every 300
miles approx.), remove filler cap with
attached dipstick, wipe dipstick clean and
insert it without screwing down. The oil
level should never be allowed to drop be-
low the lower mark (Min.). But do not fill
above the upper mark (Max.) when adding
oil.



Drain engine when hot after first 300, 750 and 2,000 miles, thereafter every 2,000 miles. The engine drain plug (19 mm. spanner) is situated on the bottom of the sump.

Lubrication of transmission:

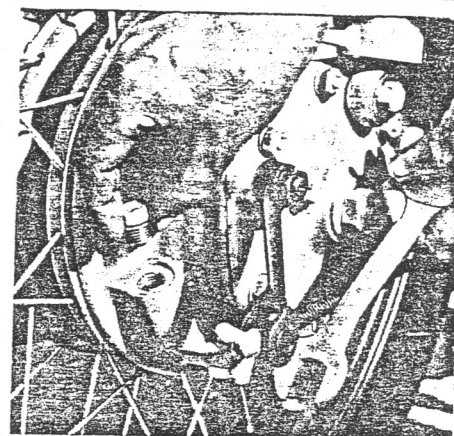
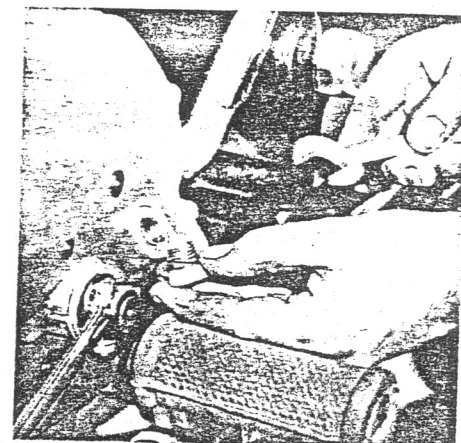
Brand name motor oil.
Oil viscosity: SAE 40 in summer and winter.
Capacity: 1.1 Imp. pints or 1.3 U.S. pints
Check oil level after first 930 miles and then every 4,000 miles and, if too low, top up to lower threads of level plug hole. Drain transmission every 8,000 miles. The drain plug (19 mm. spanner) is at the bottom of the gearbox.

Lubrication of final (bevel) drive:

Brand name hypoid oils SAE 90 in summer and winter. Capacity: $\frac{1}{4}$ U.S. pint.
Check oil level after first 300 miles and then every 1,250 miles and, if too low, top up to lower threads of level plug hole. Change oil every 7,500 miles. The drain plug (19 mm.) is at the bottom of the bevel drive housing.

Tire pressures (p.s.i.):

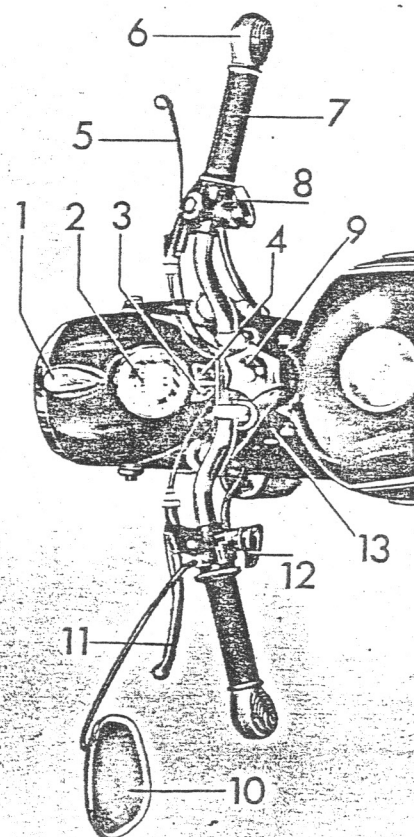
	Front	Rear	Side-
Driver alone	21.3	22.7	car
Driver and passenger	21.3	28.4	
Driver with occupied side-car	24.2	28.4	24.2
Driver with pillion rider occupied side-car	24.2	38.4	24.2

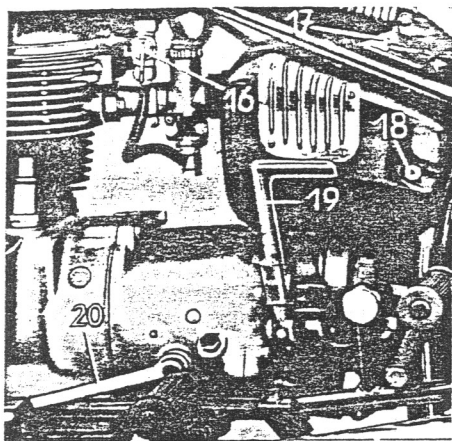


12 Operation and Controls

Operation and Controls

- Ignition and Lighting Switch:** To insert ignition key, push sliding cover forward. Ignition key in center position. The red control light in the headlamp shell indicates charged condition of the battery. Ignition key turned to the right switches on the driving light. Ignition key turned to the left switches on parking lights.
- Speedometer with mileage integrator,** markings I, II, III show maximum recommended speeds for First, Second and Third.
- The red charge indicator light goes out as soon as generator begins to charge.
- Neutral Indicator light** at the right glows green when gears are in neutral.
- Lever for front brake.**
- Blinker (turn signal) light** (standard equipment for Germany only).
- Throttle twist-grip.**
- Blinker and horn switch:** upper position = left; center = off; lower position = right. To blow the horn, push in on the switch.
- Steering damper:** On bad roads, for high speeds, and side car work, tighten damper slightly and loosen for slow solo riding.
- Rear view mirror** (supplied as standard equipment only in Germany).
- Clutch lever.**
- Dimmer and headlight flasher switch:** downward = low beam, upward = high beam. To operate the headlight flasher push-in on the switch.
- Steering lock.** Turn handlebar to its extreme right position, lift cover plate, insert the key, turn anticlockwise and push in the lock cylinder, turn key clockwise and withdraw.
- Fuel tap.** Lever positions: Low = closed, rear = open, front = reserve.
- Socket for hand lamp plug or side car lights.**
- Battery box lock.**
- Kickstarter pedal.**
- Foot gearshift pedal.**
- Micronic air intake filter.**
- Carburetor tickler.**
- Rear brake pedal.**





Starting engine
Giving throttle,
when engine is cold
when engine is warm,

Open the twist-grip slightly and simultaneously depress priming button on carburetor;
open twist-grip slightly, do not depress priming buttons on carburetor.

Turn over the engine,

with the ignition off and gearbox in neutral (red and green lamps are out) by actuating kickstarter twice.

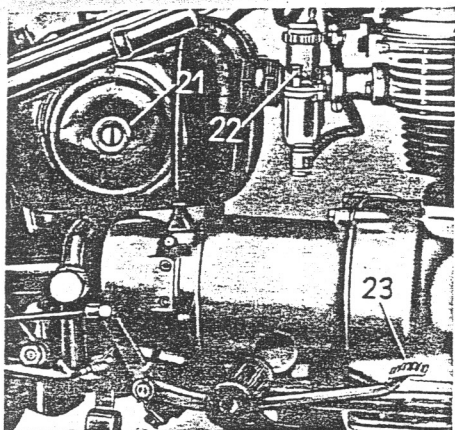
To start engine,

switch on ignition (red and green lamps light-up) and give kickstarter a short, vigorous kick.

Moving off

To change from neutral to first gear,

disengage clutch, depress gearshift foot lever (green light goes out), release clutch lever gently, and slightly open twist-grip throttle. Never move off with too much throttle, but accelerate gradually.



Changing gears

To change up from 1st via neutral to 2nd, 3rd and 4th gear,

disengage clutch before shifting, simultaneously closing the throttle, then lift gearshift foot lever (once for each gear), engage clutch and reopen throttle as required. The foot lever automatically returns to its initial position after each operation.

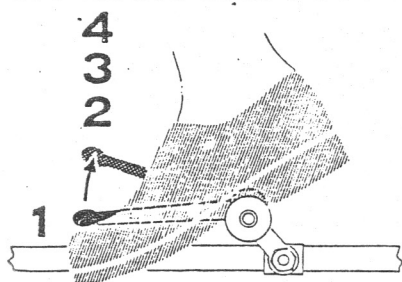
Changing down from 4th to 3rd and 2nd gear, and down to the first via neutral,

disengage clutch before shifting, leaving throttle open a little, then press gearshift lever down (once for each gear), engage clutch and open throttle as required.

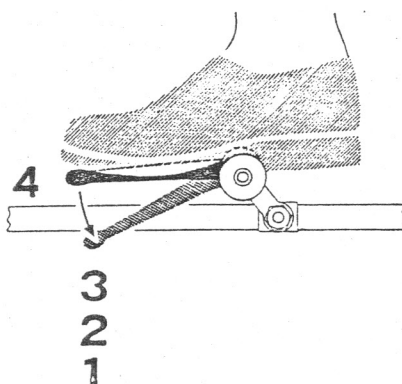
To change into neutral from 3rd or 4th gear,

step on the gearshift lever several times (down to 1st gear) and then lift foot lever slightly up into neutral.

14 Operation and Controls



Changing up from 1st to 4th gear



Changing down from 4th to 1st gear

Maximum recommended speeds in the various gears

Miles recorded between brackets	Final drive ratio for	Miles per hour figures between brackets			
		1	2	3	4
0—600 miles	Solo	12	25	37	50
	Sidecar	9	19	28	37
600—1200 miles	Solo	19	34	50	62
	Sidecar	12	25	37	47
Over 1200 miles	Solo	22	40	59	74
	Sidecar	15	31	46	56

Running-in a new motorcycle

The running-in (breaking-in) process is of vital importance for the useful life and the reliable operation of your motorcycle. For the benefit of your engine, take great care that the maximum permissible speeds listed on page 9 are never exceeded nor maintained over long stretches during the running-in period up to 600 miles and from 600 to 1,200 miles.

Engine, gearing and final drive are best run in under varying speed and load with much gear shifting as is required on hilly roads with many curves. On level roads drive at maximum speed for no more than 500 yards and then let the motorcycle coast. Never allow the engine to race when stationary.

When riding uphill shift gears at the proper moment to avoid overloading the engine. Shift to next lower gear before speed drops off too much, because driving over long distances in the lower gears does not harm the engine or the gearing.

Do not drive full speed over long stretches as soon as your motorcycle reaches the 1,200 mile limit. We recommend to only gradually extend the full-throttle stretches after very short races at the beginning.

Caution! The carburetor is not sealed to enable better running-in conditions. For this reason it is of great importance to run the motorcycle in accordance with above instructions.

Unauthorized tampering with the speedometer seal invalidates all guarantee claims.

Even when your motorcycle is through the "break-in" period, avoid engine speed dropping too much, particularly on steep grades, by shifting in time into next lower gear.

When riding downhill shift to third and, if necessary, to second and do not exceed the corresponding maximum speeds for the gears in question. On very long descents apply front and rear brakes alternately, so that one brake may always cool down.

Apply brakes gradually, i. e. increase pressure on brake slowly and only depress brake so much that the wheel does not skid.

Front braking is more efficient since, due to the inherent inertia couple of the running motorcycle, wheel adhesion is greater at front.

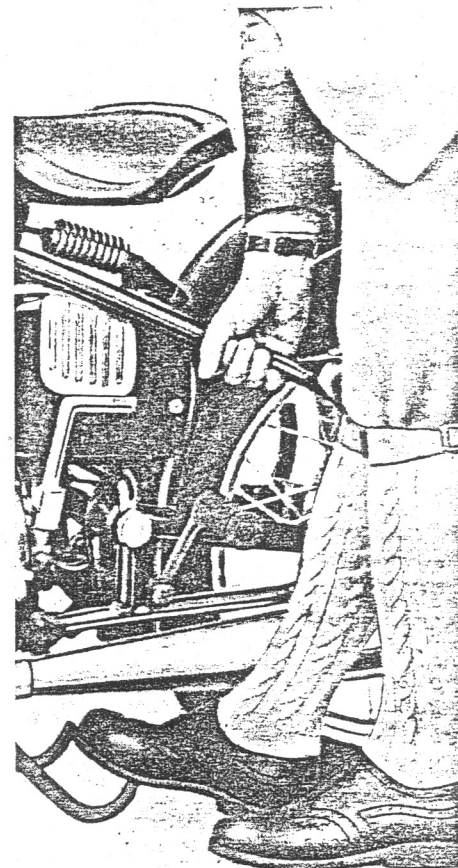
When stopping, actuate the clutch and simultaneously shift into neutral in order to avoid unnecessary wear and tear.

To turn off the engine, cut out ignition and shut the petrol tap at every standstill.

Never have ignition switched on for any length of time while engine is stopped.

Jacking up motorcycle with central stand

Tilt down the stand, depressing same on the lateral pin, and with the right-hand foot firmly stepping on the curved end of a kickstand leg pull motorcycle up and to the rear. The inertia of the machine will help to carry it up onto the stand.



16 Description

Description

A. Engine

The engine of the R27 model has been developed from the R26 design. Horsepower and torque have been increased, the first one from 15 to 18 HP, and to further improve quiet operation and durability the new engine is packed with various innovations which are all thoroughly dealt with throughout the following description and in the chapter "Technical Data". This, we hope, will help you to become fully acquainted with your motorcycle in the shortest possible time.

1. Engine Housing

The engine housing comprises a single-piece, massively ribbed, crankcase, a front crankshaft bearing cover and a chain case cover with a cover for the generator and another cover for the contact breaker on the camshaft. All housing components are cast of a highly resistant light metal alloy and age-hardened.

2. Crankshaft and Connecting Rod

The forged steel crankshaft is of the sectional type, on which the two crank web and journal assemblies are connected through a pressed-in crankpin. The stamped steel, I-section, connecting rod rides with a very sturdy cage roller bearing on the crankpin. This reduces frictional loss to a minimum and withstands extreme stress under adverse operating conditions. A bushing is pressed into small end of connecting rod as support for the piston pin.

3. Piston

The long-skirt piston of special light metal alloy is known for its quietness of operation; it carries three rings: the top ring is hard chromed, the second very slightly tapered and the third an oil ring of conventional shape. They assure efficient sealing, proper lubrication and low rating of wear. The large diameter piston pin (gudgeon pin) of the floating type is retained by circlips.

4. Cylinder and Cylinder Head

The grey cast iron cylinder has ample finning. Two protective tubes pressed into top of cylinder barrel and with rubber grommets connected to valve tappet guides care for oiltight pushrod operation. The third tube pressed into cylinder barrel serves for the oil circuit. The special light-metal alloy cylinder head is also liberally finned and provided with shrinkin valve seat rings (inserts), special grey cast iron for intake and heat-resisting steel for exhaust. Valve guides are a press fit. The cylinder head is retained to the cylinder barrel by means of four bolts, each of them pressing the head against cylinder through a long spacing of steel pressed into the head. The same steel spacers serve as supports for the rocker arm shafts.

5. Valve Control

The camshaft is mounted very high in the crankcase with ball bearings and chain driven from the crankshaft a half crankshaft speed. A chain adjuster maintains the timing chain in even tension. The camshaft carries a separate cam for each valve and cams actuate the four valves

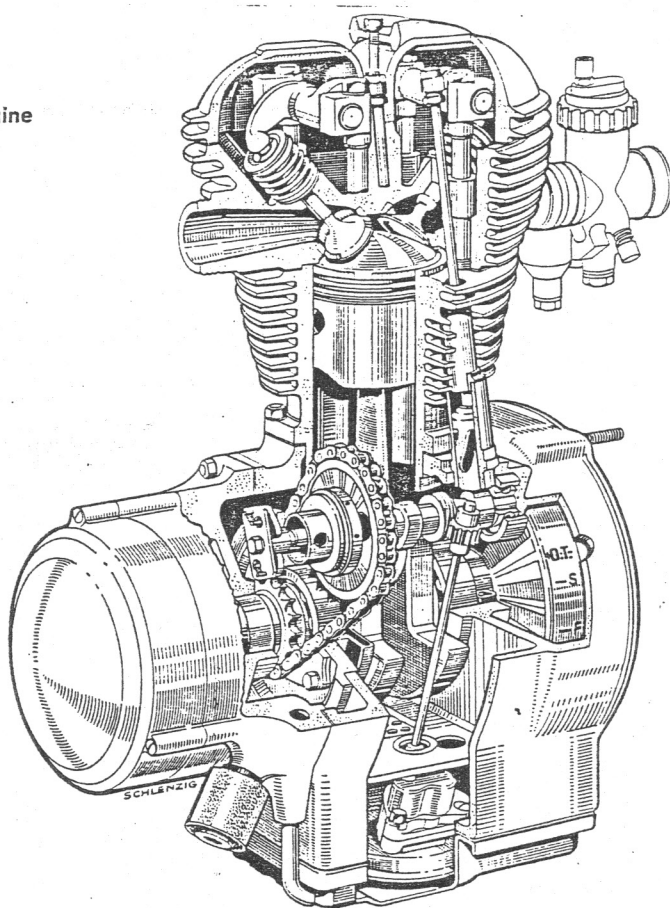
through tappets, short pushrods and rocker arms. The rockers ride in floating bushings upon their shafts.

Valve clearance adjustment is achieved in the conventional manner through setting screw and locknut on the rocker arms. Due to the clever arrangement of the cylinder head attachment the thermal expansion of the light metal cylinder head is practically prevented from influencing valve clearances. The entire timing gear has been conceived with a view to obtain an unusually high standard of mechanical silence and long life as well.

6. Lubrication System

The engine has an oil pressure circulation and splash lubrication system with oil sump in crankcase. The lubrication pump is of the gear type and driven by the camshaft over a worm drive. The pump draws oil from the sump pick-up tube and screen assembly and forces it through passage ways in the crankcase to the oil slinger on the crankshaft. Even the smallest wear particles are there centrifuged off the oil stream and collect on the inside periphery of the oil slinger, whilst the oil passes through the hollow crankpin into the roller bearing in big end of connecting rod and is as splash oil sprayed onto cylinder bore, piston, piston pin bushing and camshaft, and returns then to the oil sump. Leaving the distribution passage, pressure oil travels to an oil injection nozzle for the timing chain drive and into annular oilway in the cylinder extension whence it additionally lubricates the cylinder bore through two small drilled holes. (Improved lubrication for starting the en-

Engine



gine when cold and extreme loads.) The oil tube pressed into cylinder barrel supplies pressure oil to the rocker arm bushings; oil dropping off them flows from the valve chambers through the pushrod protecting tubes back to the oil sump.

The camshaft sprocket carries a mechanical rotary breather valve which communicates with the vent tube in the left front portion of the crankcase as the piston moves down, and closes the vent tube as the piston moves upward. The slight depression created this way contributes to prevent oil leaks at the gasket joints of the engine housing.

7. Carburetor

The attached Bing special carburetor with 26 mm. venturi is of the throttle slide pattern with an integrally cast float chamber. The flow of fuel to the carburetor is regulated by the float (1) and the float-controlled needle valve (3). To avoid irregular flow of fuel due to vibrations or shocks the float is equipped with a damper ring (2). Through the float chamber arm fuel reaches the passage (12) to the idling jet, and the main jet (5), which is fitted into the needle jet (6). With the intake valve open the piston will, on its down-stroke in the cylinder, produce a depression in the venturi (15). When the throttle slide (11) is closed, fuel is drawn from the idling jet (13) and the required air from the passage (14) so as to allow the engine to run at idling speed. The air required for idling is regulated with the pilot air screw (4). The preliminary adjustment should first be done by turning the throttle stop screw (7). The throttle slide is opened through the cable

18 Description

(17) and closed by the pressure of the throttle spring (16). The needle (9) is fastened to the throttle slide and extends with its taper part into the needle jet (6). As throttle slide and jet needle move together, the tapering needle either allows more or less fuel to pass through the needle jet as the throttle is opened or closed throughout the range.

Part of the air cleaned by the filter flows, regardless of the throttle slide opening, through the small air bleed (8) into the primary air chamber (10) in which the fuel and air are mixed to some degree. The main air stream colliding with the extending part of the primary air chamber causes a depression sufficient to complete atomization of the fuel.

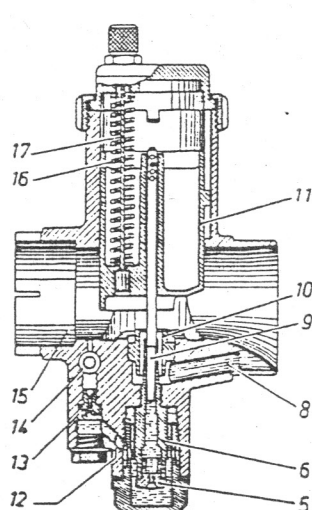
The carburetor is adjusted in the factory for the commercial grades of fuel. Thus jet size and position of needle should not be changed.

Commencing with frame No. 384 365 the carburetor is equipped with an accelerating pump which may also subsequently be installed into the R 27 models provided with the micron air intake filter system. This accelerating pump assumes the function of the former needle jet, enriching the fuel — air mixture — for smoother acceleration — from idling to the part-load range.

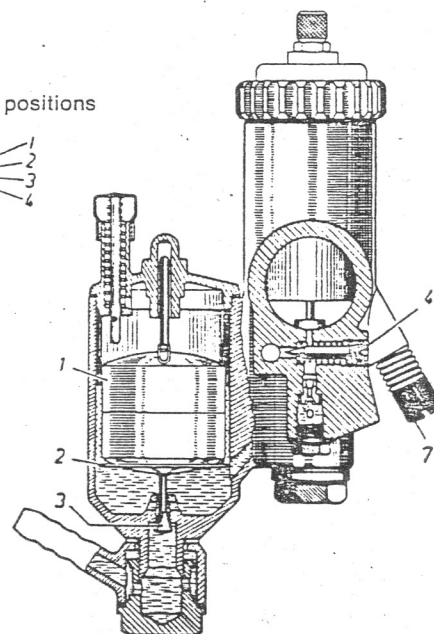
Caution!

Prolonged idling of the engine — whether it might be cold or at normal operating temperature, will be detrimental to its service life and should whenever possible be avoided.

BING-Carburetor



Needle positions



- 1 Float
- 2 Damper ring
- 3 Float needle
- 4 Pilot air screw
- 5 Main jet
- 6 Needle jet

- 7 Throttle stop screw
- 8 Air bleed
- 9 Jet needle
- 10 Primary air chamber
- 11 Throttle slide
- 12 Fuel passage to 13

- 13 Idling jet
- 14 Air passage to 13
- 15 To engine
- 16 Throttle spring
- 17 Throttle cable

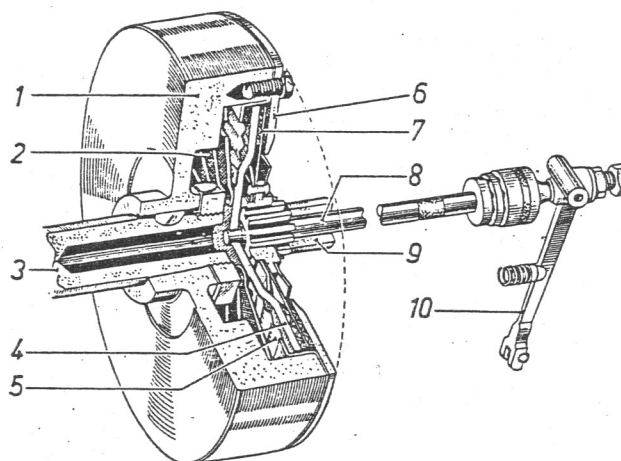
8. Clutch

The engine torque is transferred to the transmission through a single plate dry disc clutch.

A disc spring (2), acting through a metal diaphragm (5) connected to the flywheel (1), presses the pressure plate (4) towards the double-lined clutch plate (7) on splines in the bore of the flywheel. The clutch plate (7) is thus firmly held between the pressure plate (4) and pressure ring (6) screwed to the back of the flywheel. The splined bore of the clutch plate engages with the spring cushioned primary shaft (9) which transmits engine torque to the transmission.

The clutch lever provided on the left handlebar actuates the clutch release lever (10) located on the rear of transmission housing by means of a Bowden cable. Power transmission between engine and gearing is interrupted when the clutch lever is operated whereby the pressure plate (4) is drawn away from the clutch plate (7) by means of the clutch operating rod (8).

The robust single plate dry disc plate clutch needs no maintenance. As proper treatment considerably increases the service life, open the throttle only a little when starting and ease the clutch in slowly. Sudden letting-in of the clutch at high speed will not only cause great wear of the facings, but also highly stress the entire transmission and the tires. A spring on transmission housing cover presses the clutch release lever back and tightens the cable. The normal wear of the clutch lining material should be compensated now



- 1 Flywheel
- 2 Disc spring
- 3 Crankshaft
- 4 Pressure plate
- 5 Metallic diaphragm

- 6 Pressure ring
- 7 Clutch plate
- 8 Clutch operating rod
- 9 Primary shaft
- 10 Clutch release lever

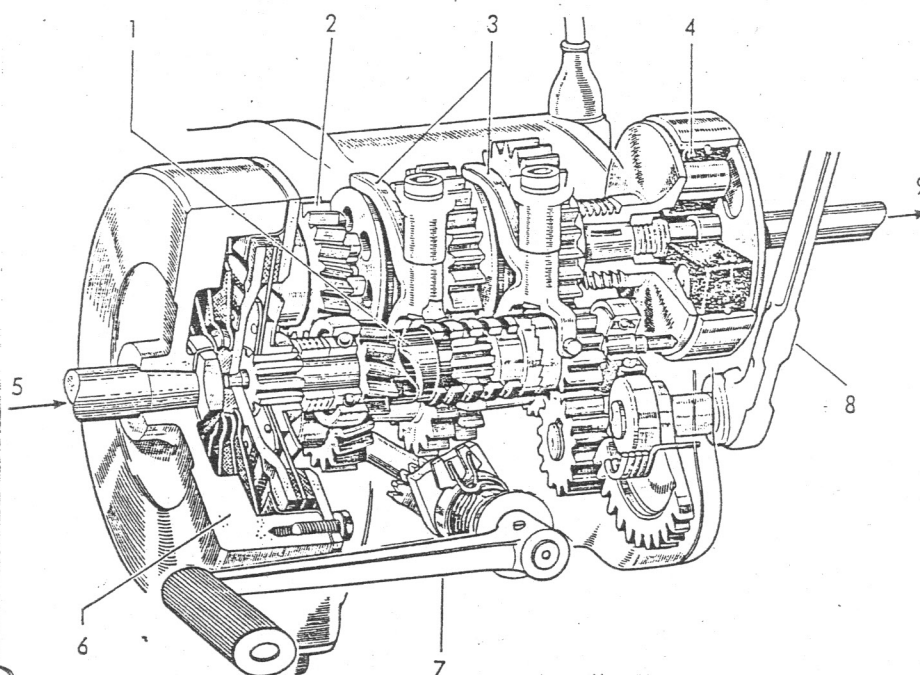
20 Description

and then. To do this, manually pull lower end of clutch release lever forward until a more accentuated resistance is felt which should take place after a free travel of approx. 0.2". If resistance is encountered earlier, then actuate the cable adjuster on handlebar clutch lever until proper distance is obtained.

B. Transmission

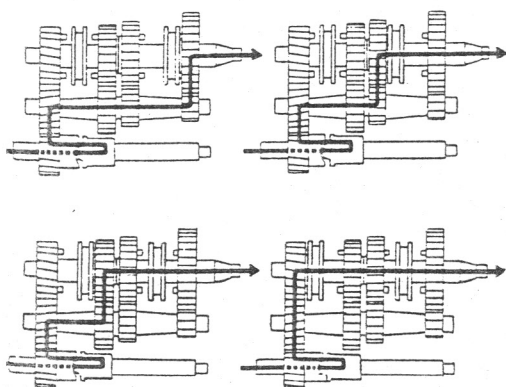
The transmission is bolted up to form one unit with the engine. Four different gears running in constant mesh even while being shifted provide easy, trouble-free gear change. The transmission has a gear chan-

Sectional view of the four speed gear



- 1 Torsional vibration damper on primary shaft
- 2 Fourth-speed gear
- 3 Striker forks
- 4 Rubber coupling

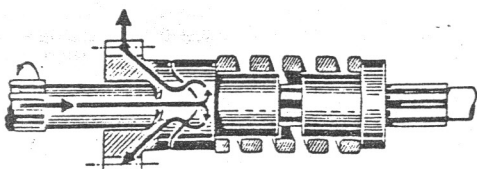
- 5 From engine
- 6 Flywheel with clutch
- 7 Gear change pedal
- 8 Kickstarter pedal
- 9 Towards rear wheel



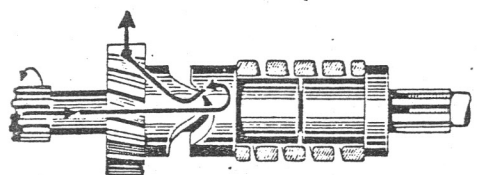
Power flow through the four gears

ge mechanism of the ratchet type, designed for foot operation. When the shift pedal is operated, a cam plate is turned by a toothed segment. This cam plate has two milled, curved grooves in which en-

Power flow through spring-cushioned drive



Drive pinion in normal position



Drive pinion in damping position

gage the operating pins of the two selector forks. In accordance with the position of the curved grooves the selector forks are shifted by turning the cam plate and impart their movement to the corresponding coupling discs which engage or disengage the pairs of pinions being shifted. The stop gear change mechanism incorporating a ratchet plate enables proper selection up and down for it only moves one stage at a time.

Raising the pedal engages the next higher gear and moving it downwards engages the next lower one.

In order to ensure a smooth power flow through the various gears the drive pinion on the primary shaft features a torsional vibration damper. This arrangement reduces the load on the individual gear parts and increases the service life of the transmission.

An electrical contact in the transmission switches on a green light in the headlamp shell when the gears are in neutral.

The gear box has its own oil plug hole through which oil level may be checked and topped up as per lubrication chart.

C. Final Drive

The R 27 model is equipped with the well-proven cardan shaft type final drive found on all BMW motorcycles.

The cardan shaft is enclosed in the right-hand member of the rear fork and has an elastic rubber joint as coupling element toward the gearbox. The rear end of the cardan shaft carries the female member

of a gear coupling. The male member of this coupling is free to slide on splines on the bevel drive pinion shaft.

This arrangement ensures absolutely reliable and smooth power transmission from engine to rear wheel.

The bevel drive pinion runs in a roller bearing, at rear, and in a doublerow angular contact ball bearing, at front. Driving pinion and crown wheel (ring gear) are of the spiral bevel pattern, running in oil with utmost quietness owing to careful lapping treatment and accurate adjustment.

Ring gear is bilaterally equipped with ball bearings in the bevel drive housing.

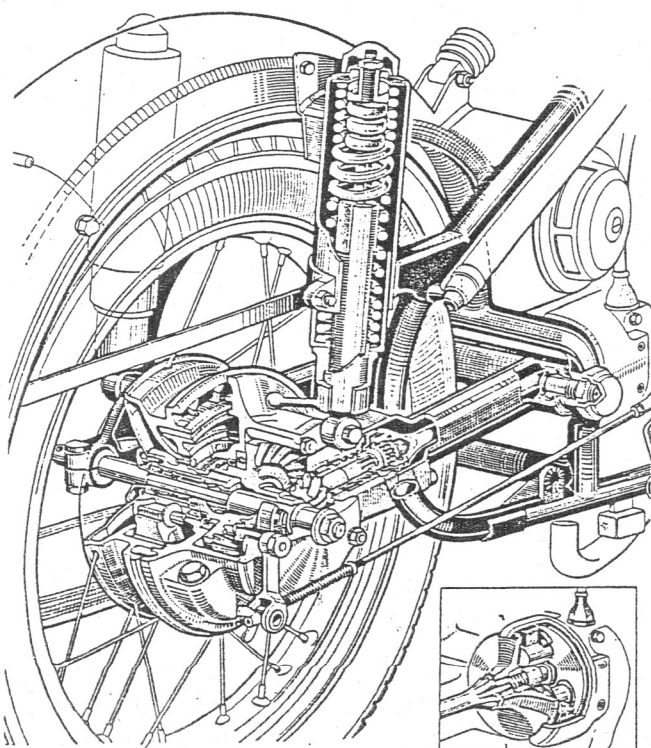
A coupling dog toothing on ring gear hub serves to transmit the motion to the rear wheel, which is easily removable past withdrawal of the knockout hub spindle.

Bevel drive housing and cover are oil and dusttight, the protruding wheel spindle ends and the drive pinion shaft being equipped with oil seal rings. Should any oil ooze out, it runs into the open, a) from the pinion bearing through a drilled hole on the right swing arm flange at rear and b) from the ring gear bearing through a drilled hole in the bevel drive housing behind the oil seal ring, which ends beside the oil drain plug to the open. The brake connected to the housing remains thus exempt from oil.

The oil level in bevel drive housing should be checked and the oil topped up or replaced as per lubrication chart.

Load variations call for a change in bevel gear ratio, which is different for solo and side car work. For changing from solo

Crosscut through final drive



to sidecar operation or vice versa the bevel gear set in final drive must be replaced each time. (See "Subsequent mounting of sidecar", page 38.)

D. Chassis

1. Frame

The frame of the duplex cradle steel tube type has been designed for top strength. It forms the skeleton, to which the other major components of the motorcycle are attached. All necessary side-car attachment points are provided on the frame.

2. Engine Mounting

Five large rubber cushions support the engine block, absorbing vibrations and power impulses before they can be transmitted to the frame.

The rubber-balanced engine location within the frame insures an unusually high degree of riding comfort; this and the many other outstanding engineering features built into BMW motorcycles prove once more that Bayerische Motoren Werke AG. are always endeavouring to provide the ultimate in comfort and engineering quality.

3. Fuel Tank

The fuel tank has a capacity of 15 liters (3.3 Imp. gal. or 4 U.S. gal.) and is rubber-mounted to the frame. The tank incorporates a water-tight, locking tool-box. The rubber knee pads fitted to both sides of the tank help much to increase riding safety. The tank has two pipes leading to the fuel tap, one exceeding the other so far

in height that a reserve of approx. 1.5 liters (3.0 U.S. pints or 2.6 Imp. pints) of fuel remains in the tank when the tap position commands supply through the higher pipe. Switching the fuel tap to the "R" (Reserve) position then allows the motorcycle to travel an additional distance of approx. 25 miles.

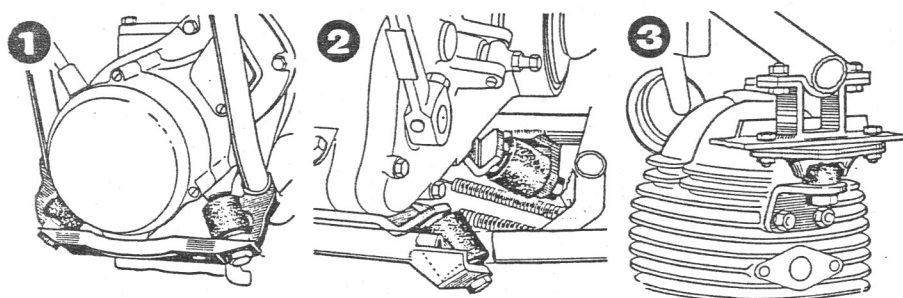
It is however advisable to always refuel in time and to switch over to position "R" in an emergency only — but in good time. Thus you will avoid a momentaneous scarcity of fuel, likely to damage the piston during a full throttle run.

4. Central Stand

A central stand attached to the frame and held in place during riding by two return springs, serves to park the motorcycle. To operate, release the stand from the raised position by pressing with the foot against the pin on the leftside leg.

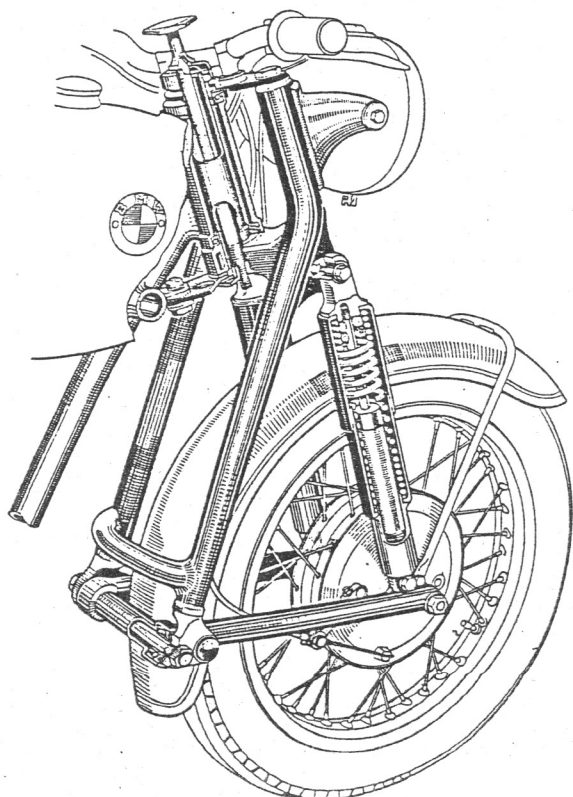
5. Front suspension

The front wheel is located in a bottom-link swing fork, Earles pattern, the two swinging arms pivoting in adjustable roller bearings mounted without perceptible play as is the rigid part of fork in the steering head. The two bearings can be lubricated through a grease nipple. The road bumps are damped by two telescopic shock absorbers with incorporated doubleacting oil dampers. The shock absorber units are fixed to the swing arms, on bottom, and to the rigid fork, on top, the upper connections being cushioned by rubber bushings. The multi-rate coil spring supports with its lower end on the inner covering tube, and with its top end on the outer shroud. The oil damper tubes are screwed into the lower shock absorber connections and the damper rods in the upper connections. In order to avoid excessive loads on the shock absorber attachments the oil dampers are provided with rubber rings. If a side car is attached to the motorcycle it is necessary to transfer the swing arm pivot spindle of front fork from its rear location for solo) to the front mounting in order to reduce the front-fork trail for easier steering. Moreover the shock absorber top mountings must be adjusted for sidecar-work by transferring the fixing locations machined in the front fork brackets.



Engine mounting to frame on engine housing at front (1), on transmission housing at rear (2) and on cylinder head (3).

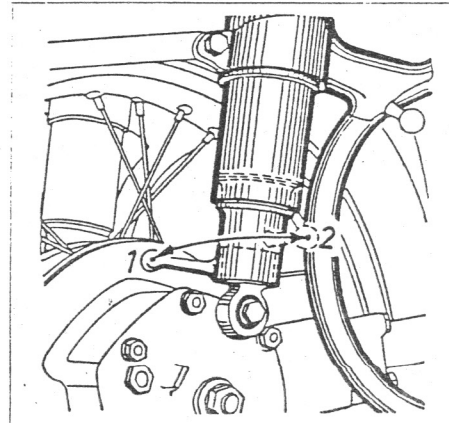
Front Fork



6. Rear Suspension

The rear wheel is located by a swing fork, which pivots in adjustable taper roller bearings, fitted without perceptible play, on the vertical frame members. The road bumps are damped by two shock absorbers.

The bottom ends of these shock absorbers are rubber-mounted, upon the bevel drive housing at right, and the left-hand member of the pivoted fork, at left. The multi-rate coil spring within the shock absorber unit seats upon the inner covering tube, on bottom, and its top end abuts on the outer covering tube which is fixed to the frame.



Adjustment of rear suspension:

Position 1 = Solo riding

Position 2 = Sidecar work

Each shock absorber contains, screwed to its lower connection, a double-acting oil damper the rod of which supports with its rubber-cushioned top end on the outer shrouding.

For the compression movement of the suspension rubber rings are provided on the damper rods to avoid excessive loads on the shock absorbers and their attachments. The lower part of each shock absorber unit features an adjusting sleeve which moves upon a graduated cam, so that by turning the adjusting lever from position (1) solo riding to position (2) required for the carriage of a pillion passenger nearly the same suspension rate is obtained.

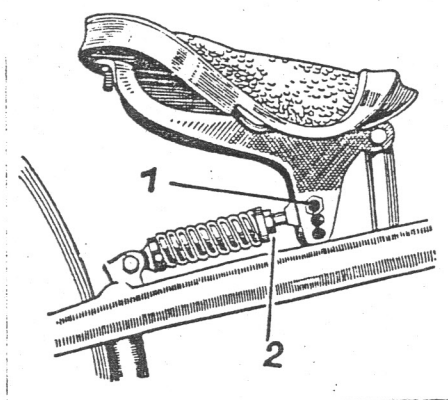
If a side-car is attached to the motorcycle, the oil springs must be replaced by stronger types provided for this case.

7. Cushioned Seat

The seat is a well-shaped, soft, swinging saddle which, in conjunction with the all-wheel sprung frame and good cushioning, warrants tireless riding over long distances. To adjust seat to driver's weight, the tension of the spring can be regulated by spring clamping pin (1) in the slot of the saddle supporting lever.

There are four catches provided in the saddle lever for weights from 130 to 220 lbs. Upper catches give softer spring action, lower catches give harder spring action.

Height of saddle can also adjusted by screw (2). Please, don't forget at every lubrication service, to apply some drops of oil to the mounting points of the saddle spring. On request, the motorcycle can be supplied with a dual seat.



8. Wheels

The wheels are provided with steel drop-center safety rims. The rim profile of ingenious design prevents the tires from slipping off the rim during a blow-out, and on the other hand facilitates tire fitting. The straight, non-angular spokes are a further advantage. Due to the low weight of the wheels the unsprung masses of the motorcycle are insignificant and thus help to assure excellent steering and driving qualities. The weatherresistant rims add much to the exterior of the motorcycle.

The wheels run on accurately set, adjustable taper roller bearings; they warrant long service life and require very little maintenance.

9. Brakes

Front and rear wheels are both equipped with light-alloy, full hub brakes with cast-in grey iron rings. This provides low weight, high braking efficiency and quick dissipation of the friction warmth on braking. Front wheel brake is operated by means of a cable from the handlebar, and a foot pedal controls the rear wheel brake through an operating rod. When being depressed, the brake pedal switches on a stop light in the tail lamp body.

As the highest degree of safety for rider and machine depends on the condition of the brakes, it need not be emphasized that the brakes must be subject to constant care and observation.

E. Electrical Equipment

The 6-volt battery with a capacity of 9 ampere-hours is housed in a protective box attached to frame. The switch for ignition and lighting is operated with the key in top of headlamp shell.

1 = Ignition key inserted = Ignition switched on

2 = Parking light

3 = High beam and dipped beam light.

The swivel switch for selection of either high or low headlight beam is located at the left handlebar grip. Pushing-in on the switch operates the headlight flasher.

The swivel switch for the directional lights is located at the right handlebar grip. Pushing-in on the switch operates the horn.

The 6-volt generator supplies the necessary current for ignition and lighting. It is

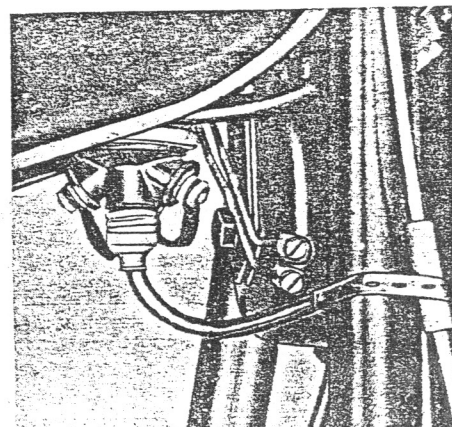
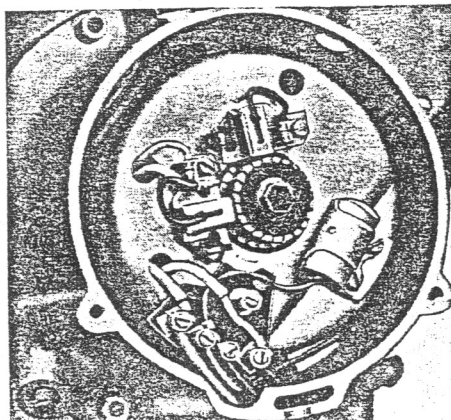
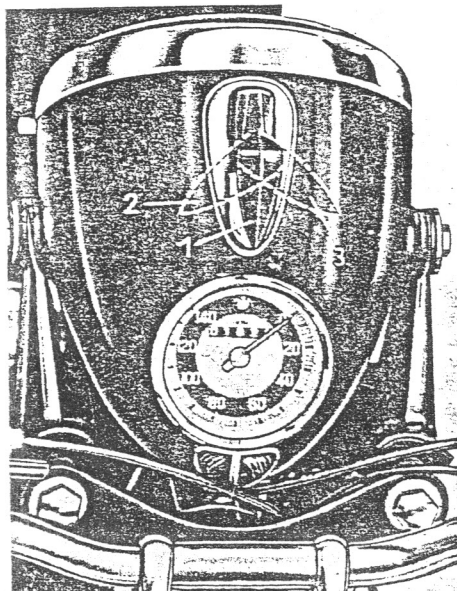
housed at front in the chain case cover, its armature seats on front crankshaft journal. Rated output of generator 60 watts at 1800 r.p.m., maximum output 90 watts at 2300 r.p.m.

The cut-out relay for the voltage regulation is separately from the generator attached to the upper frame tube below the fuel tank.

It also closes and opens the circuit between generator and battery. It closes the circuit when the generator operates to charge the battery, and opens the circuit when the generator is not operating to prevent the battery from discharging back through the generator (red indicator light

"off" or "on", respectively). A rubber cap protects the voltage regulator against moisture. It is sealed and servicing should only be done by an Authorized BMW Service Station.

The contact breaker is actuated from a cam fitted to camshaft front end, so the breaker performs one opening as the crankshaft turns twice. The ignition coil fitted to the upper frame tube (see illustration) then delivers high voltage ignition current to the spark plug so the fuel-air mixture in the cylinder is ignited by the spark on the electrodes. Ignition is automatically timed by a centrifugal advance unit in accordance with the engine speed.



Servicing the Motorcycle

Cleaning Exterior

The engine and transmission unit, and the final drive are best cleaned with petrol and the lacquered parts washed with a sponge and polished with a chamois skin. Before applying a water hose, be sure that engine is sufficiently cooled off. Cover air intake on filter before spraying. Avoid using high pressure and do not play the hose directly on carburetor and ignition coil. When motorcycle is dry, oil brake control joints and hinge of rear mudguard to prevent these parts from rusting.

As water may infiltrate into the brake housings during washing, try out brakes carefully in a trial run after cleaning.

Treating the lacquered and chromium-plated parts with commercial polishes preserves these parts and gives them a glossy appearance.

Technical Maintenance

In order that your motorcycle may provide maximum service and dependability certain periodic lubrications and inspections are required which should best be left to your BMW dealer's workshop. However, in the event that you have to perform this servicing yourself, the following instructions will be useful: **Lubrication of the**

engine, transmission and rearwheel drive see pages 10-11. Before performing these oil level checks, wait for a few minutes after turning off the engine. Whenever possible, **change the oil** on the various units while they are still hot and after the last traces of old oil have dropped off.

Lubricate the **swinging arm bearings** every 2,000 miles. For this, use a manual grease-gun only (with tapered mouth-piece). To lubricate the rear swinging arm bearings, unscrew the SW 36 aluminium acorn nuts on both sides and in each case apply some strokes of grease through the orifice provided in the pivot.

The front swinging arm bearings are supplied with grease through the funnel-type grease fitting located on the transverse tube of the swinging arm. Carefully apply grease until this comes out on the sealing lip of the radial seal on each side of the bearing. Don't wipe off this grease, but spread it around the gap between fork-prong and swinging arm, as this constitutes an additional protection of the bearing against splash-water.

Lubrication of the wheel hubs and the control cables should be left to a BMW garage because of the difficulty involved in the disassembly and subsequent adjustment of these units.

The brake linkages, the footbrake and clutch pedals, the rear mudguard hinge, and the kickstand bearing should be cleaned and then lubricated with a few drops of engine oil every 2,000 miles (3,000 km.). The pivots of the suspension and the saddle are rubber-mounted and must not be lubricated.

28 Inspections and Maintenance

Inspections and Maintenance (see also Maintenance Schedule)

Likewise, the following operations should not be performed by yourself unless there is no chance to reach a BMW dealer's workshop.

The tool kit supplied in the tool box should facilitate this purpose.

Battery: Every 4 to 6 weeks examine the electrolyte level in the battery, and top up if necessary with distilled water until the level reaches the perforated plate in the filler orifice. To do this, first loosen the rubber strap securing the battery, then lift same out of its box and hold it horizontally for checking.

The air filter must be removed at least every 3,600 miles (6,000 km.)—more frequently under especially dusty conditions—and the filter element must be carefully tapped and blown out. Do NOT use compressed air. Replace the filter element every 7,200 miles (12,000 km.). Fouled filters give rise to increased fuel consumption and reduced performance.

Cleaning the Fuel Tap:

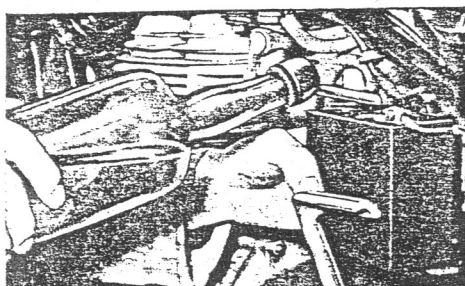
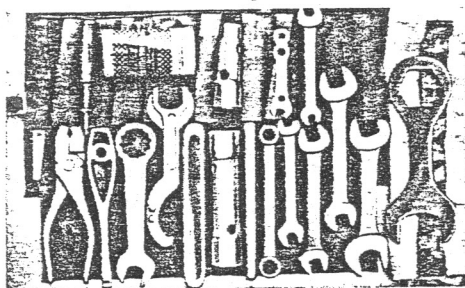
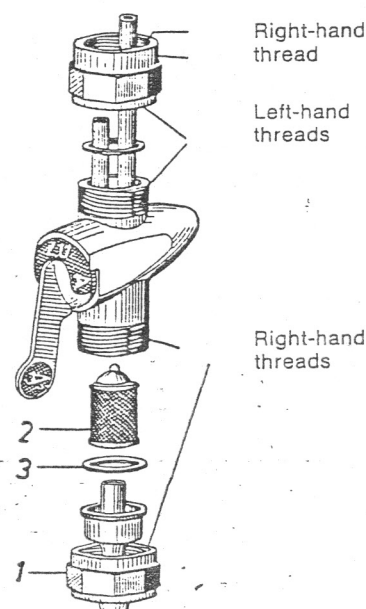
In case of troubles in fuel line, also the fuel shut-off tap must be cleaned.

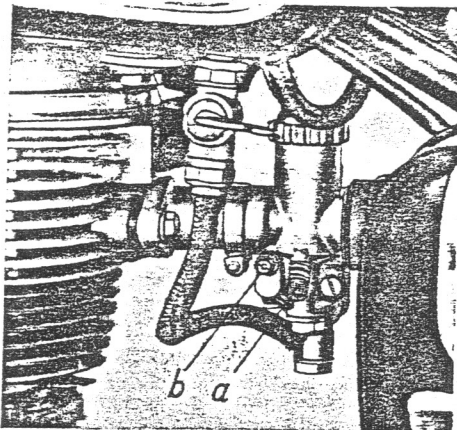
1. Close the fuel tap (lever downward).
2. Unscrew union nut (1) (24 mm.).
3. Remove filter (2) and wash it in gasoline.

4. Take care that gasket (3) is not lost. The fuel tap top nut is right-hand threaded on tank side and has a left-handed thread for tap connection. To remove tap,

nut anticlockwise while holding the tap. For refitting, insert gasket, engage nut with larger tubular section on top simultaneously in the two threads and tighten by rotating nut in clockwise direction.

Caution: The fuel shut-off should always be filled with gasoline to prevent it from becoming leaky (a stay in dry condition for some hours is unimportant).





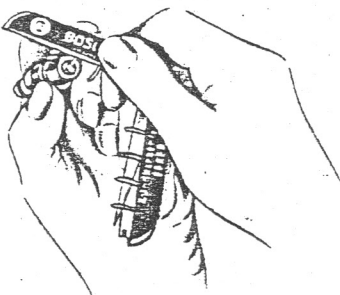
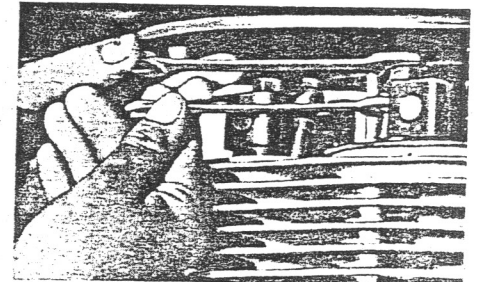
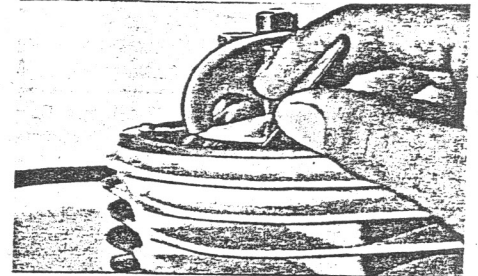
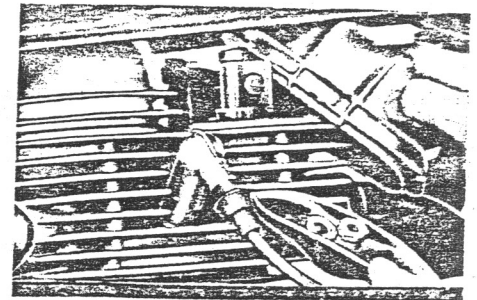
Carburetor: Every 3,750 miles, remove, dismantle and clean this unit thoroughly and blow through passages and jets. These jobs require re-adjustment of the idling run after refitting and can therefore be carried out only by those owners who are in possession of the necessary skill. On dismantling, it is convenient to avoid rotating the throttle stop adjusting screw (a). To adjust the pilot air screw (b) rotate it right home and then unscrew it two turns. Starting from this basic adjustment bear in mind that rotating the pilot air adjuster inwards enriches the mixture, and unscrewing weakens it. Rotating the throttle stop adjusting screw inwards increases the idling speed, and unscrewing decreases it. Adjust throttle cable play to .02" with the knurled nut after loosening the locknut (9 mm.). For checking cable play see page 33. Whenever removing and installing the rubber sleeve connecting the carburetor to the intake air filter box make certain that the driphole (2 mm diam.) contained therein is situated vertically downwards.

Adjusting Valve Clearances

Every 4,000 miles, prior to valve adjustment, using a torque wrench, check the cylinder head bolts for the specified torque of 25.3 ft. lbs. on cold engine, and retighten if necessary. These operations may eventually be entrusted to a BMW dealer's workshop.

The adjustment of the valves is only described for the event where there is no chance to reach a BMW workshop.

For this, use cranked ring spanner (14 mm.)



to unscrew the nut on rocker cover bracket and remove bracket with nut, spring washer and the rocker covers. Remove gasket carefully to avoid damage.

Now turn the engine until the piston is at top dead center of the compression stroke and both valves are closed.

Then check the clearances with the feeler gauge supplied in the toolkit and, if necessary, reset with the adjuster screw (11 mm.) after loosening the locknut (12 mm.).

Checking the Spark Plug

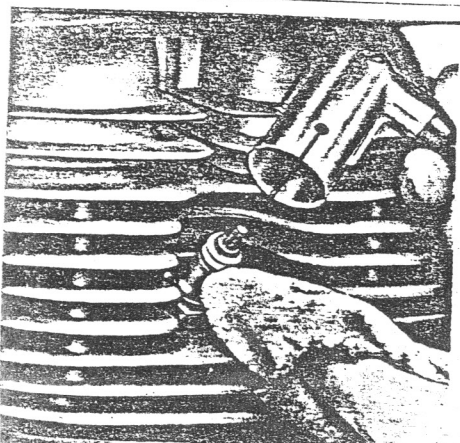
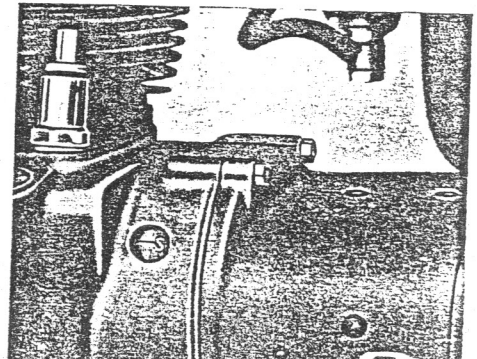
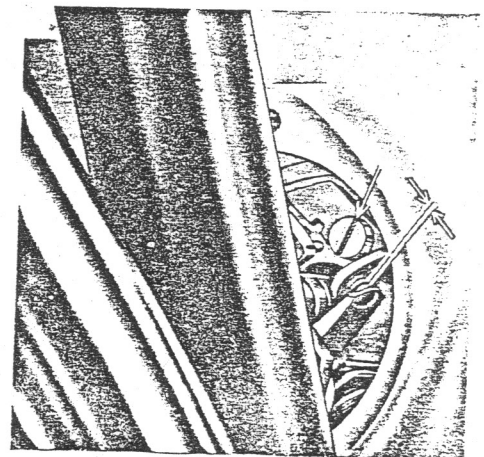
The spark plug should be checked every 3,750 miles and the gap, if necessary, reset to 0.7 mm. by bending the ground (side) electrode carefully. Re-check the gap with the feeler gauge.

Deposits and dirt accumulations in the spark plug interior are likely to cause pre-ignition; any spark plug found in such a condition should thoroughly be cleaned, best in a service shop. After a maximum of 11,000 miles the spark plug should be replaced.

Keep outer, glazed plug insulator clean by wiping it from time to time with a dry cloth after removing the plug adapter, so as to avoid creeping currents on this place which would reduce the intensity of the ignition.

Contact Breaker and Ignition Point

Every 3,750 miles check the breaker for clean and smooth contact points. Slightly uneven or oxidized points may be carefully dressed with a few strokes of a clean, finecut contact file or should be replaced. Check point opening which should be 0.4



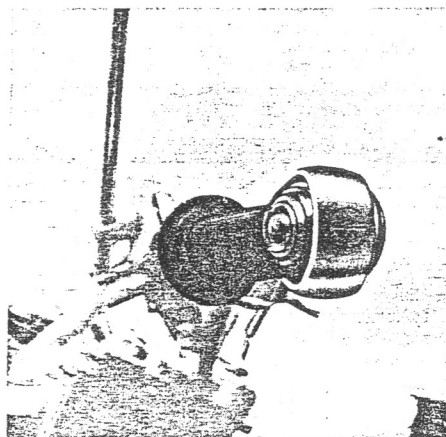
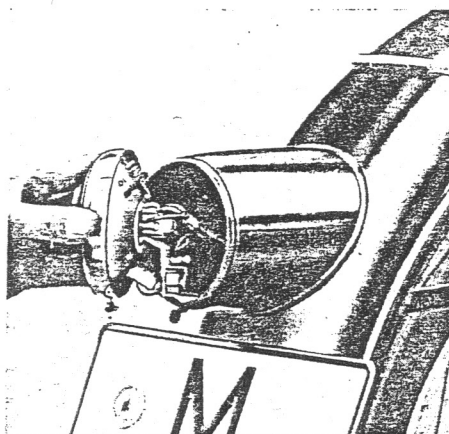
means of the feeler gauge and reset, if necessary, the moving point. Both points must be parallel in closed position.

It is recommended to have this work done in a BMW service station, because each time the breaker points are replaced or adjusted the timing should be checked and adjusted. Ignition timing and advance through the centrifugal advance unit is best checked with a timing light, with engine running at idling speed.

If a timing light is not available, remove rubber plug on inspection hole opening provided in left side of engine housing and check the position of the flywheel mark "S" (Initial Ignition Timing). When the moving contact point just starts opening, the "S" mark should line up with the scribe line in the inspection hole. (Engage top gear and turn engine in the direction of rotation by revolving raised rear wheel by hand.)

This is the correct ignition setting with the spark taking place 7° BUDC and engine running at idling speed (governor bob-weights in the inner position). The setting for maximum advance is indicated by the check mark "F" on the flywheel (42° BUDC, governor bob-weights fully extended outward). This setting should only be checked with a timing light following the workshop instructions.

The Trail and Stop Lamp incorporates a two-filament bulb. Access to it is gained by removing the slotted retaining screw from bottom of rim and lifting lamp body out of snap attachment on top. This also gives access to the license plate lamp.



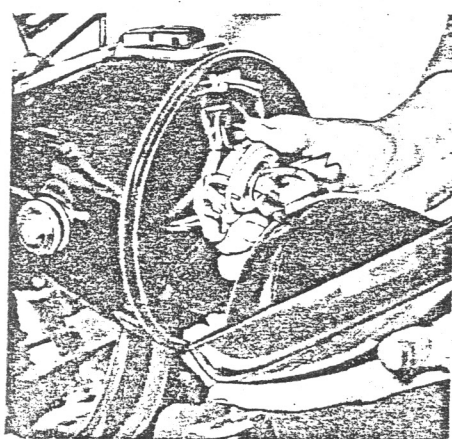
Blinker Lights. The blinker unit is installed in the headlight. To remove the blinker bulb assembly — for example, in order to disassemble and lubricate the throttle twistgrip — the following steps are necessary:

1. Remove the plastic cover plate, cover plug, and the bulb.
2. Take the insulated contact bracket for the bulb, together with the spring and electrical wiring, out of the end of the handlebar and disconnect the wiring by releasing the screw terminal.
3. Using a screwdriver, loosen (note: do NOT screw out) the screw in the tapered clamp holding the blinker housing and then tap lightly on the handle of the screwdriver.

The headlamp bulbs may be replaced in the following manner:

1. Slacken slotted-head fixing screw beneath the headlamp rim and remove headlamp front and reflector.
2. Remove wire clip securing the lamp holder and withdraw the holder together with the lamps.
3. Push in Bilux lamp and pilot lamp, rotate anti-clockwise and remove them from the holder.

The bulbs for speedometer illumination and generator charge and neutral indicators are located in push-in type sockets and are also removed by pushing-in and anti-clockwise rotation.



To replace these bulbs, however, it is necessary to remove the speedometer after unscrewing the flexible drive and the fixing nut. Refit the speedometer holding bracket so that its bent portion shows to the speedometer lamp.

Headlamp Adjustment

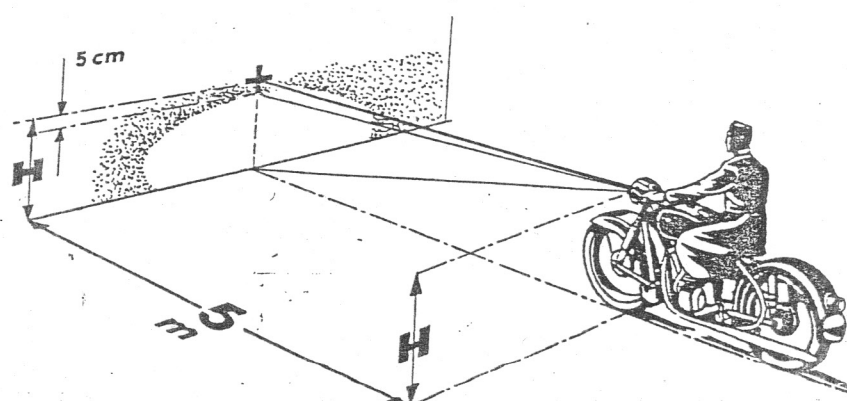
If the headlamp has a poor range and will cause dazzle, the headlamp should be re-adjusted. To aim the headlamp make a cross on a light-coloured wall at a height corresponding to the center of your headlamp. The motorcycle stands on the wheels

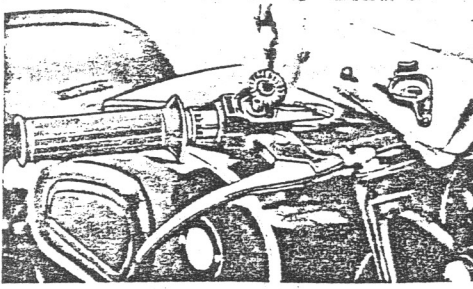
5 1/2 yards from the wall and is loaded with the rider.

Switch on the main driving light and adjust headlamp so that the center of the bright spot on the wall coincides with the marking.

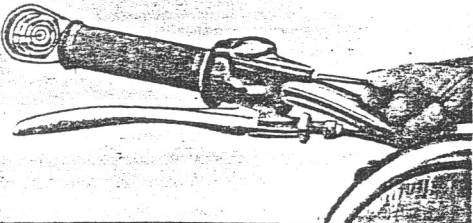
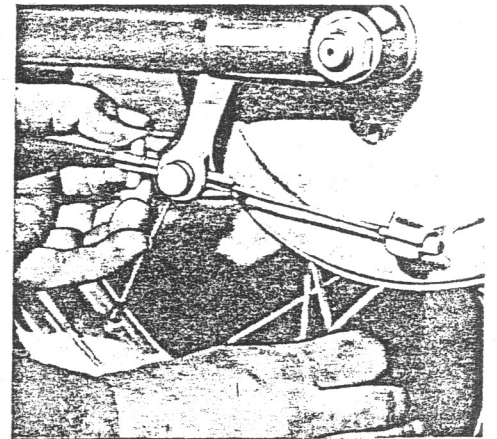
Having switched over to the dipped beam the upper border of the illuminated area should be at least 2" below the mark. If this distance is less than 2", the headlamp must be re-adjusted.

The adjustment for side-car work is done with motorcycle loaded with the rider and one person in the side-car.



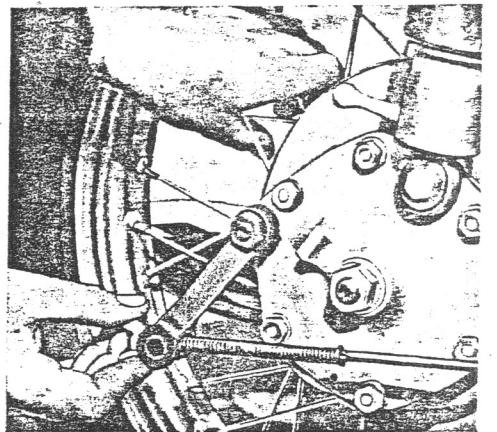


External screws and nuts. Every 3,750 miles check them for tight fit. Tighten wheel spindle nuts only with 22 mm. socket spanner and tommy bar without extension. Check maniability of **throttle twist grip**. If necessary, detach the top of twist grip body and withdraw the twist grip barrel. Grease inside of barrel, the gearing and throttle cable operating chain. When refitting the throttle twist grip ensure the full movement of throttle cable and the correct position of safety slot.



Check, eventually re-adjust cable plays: for carburetor .02", measured at the closed throttle twist grip. Re-adjust by means of the knurled adjuster on the carburetor after slackening the lock nut with 9 mm. spanner (central figure).

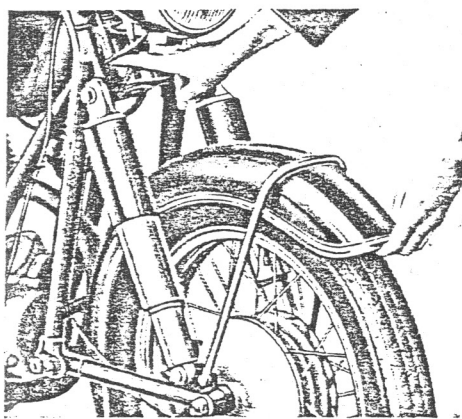
For clutch .16" to .20" of play. Re-adjust with knurled adjuster on left handlebar lever after slackening the locknut.



The brakes are of utmost importance for the owner's safety and should be checked regularly (before every long trip) for maximum efficiency and sufficient lever movement.

The front brake cable (.16 to .2" of play) is adjusted by turning the wing screw on brake operating lever or the knurled adjuster on the handlebar lever.

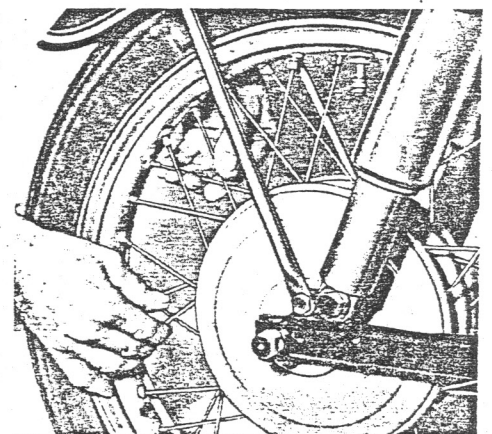
The rear brake adjustment is done by turning the wing nut on the pull rod in clockwise direction. When adjusting brakes, ensure between rest position of levers and their positive action there is left as much free travel that the wheels turn freely.



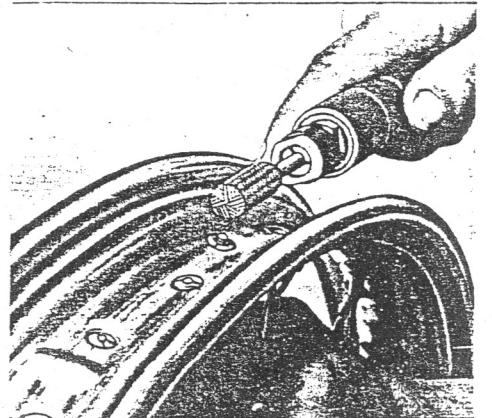
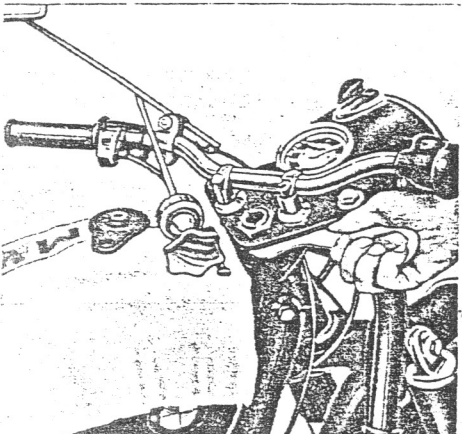
If the proper braking action cannot be achieved by adjusting the brakes, then the linings will be worn out and must be renewed.

Steering head. Every 3,750 miles test for play in the steering head. Place the motor-cycle on the central stand and slacken the steering damper right off. Then, when grasping the front end of mudguard and trying to move same up and down, no perceptible play should be felt at the steering head between frame and fork. If incorrect, adjust in the following manner:

Unscrew steering damper completely upon having removed the cotter pin on its bottom end, slacken the fork crown and column locknut (36 mm. spanner), tighten fork head race adjuster nut beneath the head clip (41 mm. spanner) as required and retighten the locknut. Having done the adjustment the forks should rotate freely when the handlebar is turned.



The wheels. On every major maintenance inspection check the wheels for tight fit of the spokes. Be careful to retighten in a manner that the rim is correctly centered. Having tightened for considerable amounts remove tires and rim bands, and see if the spoke ends protrude too much beyond the nipples. Grind down protruding spoke ends and re-cover them with the rim band before refitting the tires. This is necessary in order to prevent rim band and inner tube from getting damaged. The hub bearings must be checked for freedom of play. Since the adjustment of the taper roller bearings is done by insert-

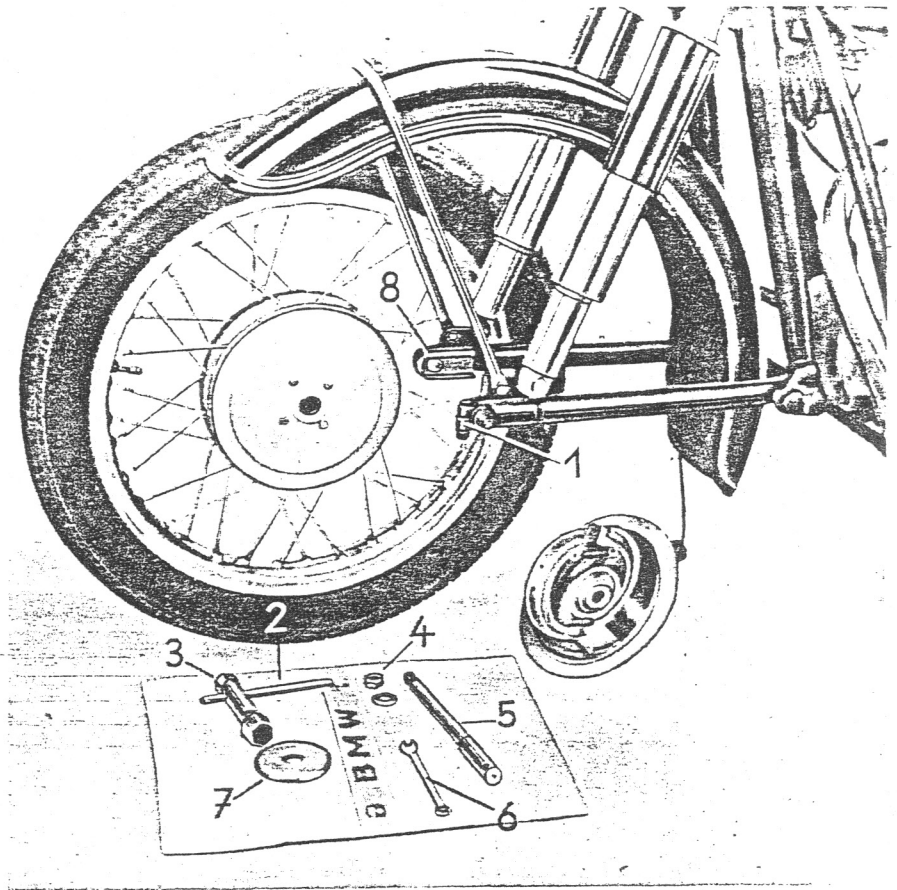


ing shims of appropriate thickness, this should be carried out by a BMW service station.

This opportunity should be used to check the wheels for out-of-balance and to eliminate this condition by installing balance weights on the spokes. Well balanced wheels insure steady steering and a higher degree of safety at high driving speeds.

Removing and Installing Front Wheel

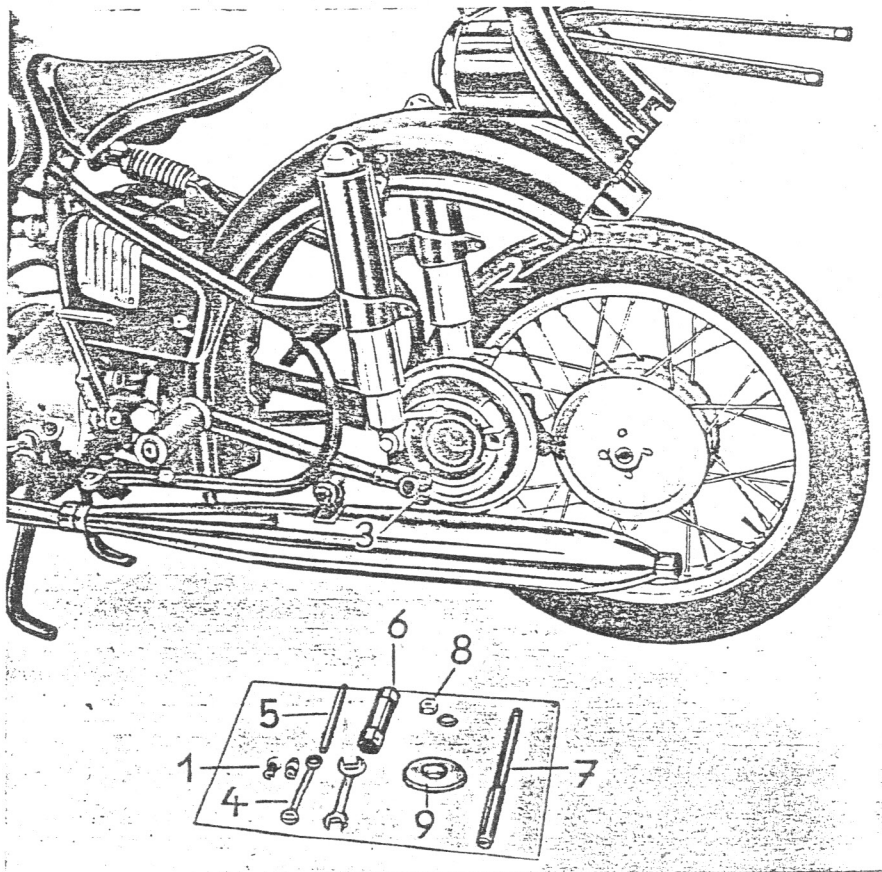
1. Set motorcycle on center stand and place a box or block under the crankcase.
2. Remove wheel spindle nut (4) and washer, using 22 mm. box spanner (3).
3. Loosen clamp screw (1) on left swing arm, below, with 14 mm. spanner (6).
4. With the aid of tommy bar (2) remove wheel spindle (5) and draw front wheel with brake sup, prt plate and dust excluder (7) forward.
5. Take brake support plate out of brake drum. The brake plate remains suspended on brake cable and front wheel is free.
6. When installing wheel, make certain that the nose on brake plate fits into the corresponding guide on right swing arm end (8). Wheel spindle must be cleaned and slightly greased before refitting.
7. Before tightening the clamp screw (1) on left swing arm move front fork several times up and down to make sure that no parts jam within the springing mechanism.



36 Inspections and Maintenance

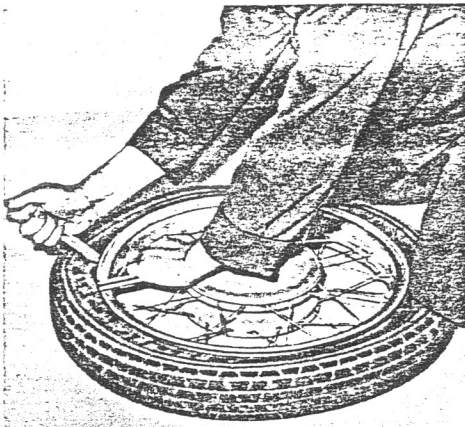
Removing and Installing Rear Wheel

1. Set motorcycle on central stand.
2. Remove retaining screws (1) of mudguard stays and mudguard connecting screws (2) with 14 mm. spanner (4) and raise mudguard end.
3. Remove wheel spindle nut (8) and washer on drive side with 22 mm. box spanner (6).
4. Remove 17 mm. clamp screw (3) from left swing arm and draw out wheel spindle (7) by means of tommy bar (5).
5. Remove wheel with dust excluder (9).
6. When inserting the well cleaned and slightly greased wheel spindle (7), rotate same so it does not jam, install washer and tighten spindle nut (8). Compress rear suspension several times to make certain that no parts of springing mechanism jam, and finally tighten clamp screw (3).



Replacing Tires

Allow tube to deflate and push upper edge of cove from rim shoulder all the way round. Remove rim nut and push valve inwards. At the side of the valve, ease the upper bead down into the well and starting at a point diametrically opposite the valve lift circumference of top bead over the rim with the aid of two tire levers. Withdraw the tube and lever the second bead from rim in similar manner to first. To fit the tire drop the bead at the side of the valve into the well and commencing at a point diametrically opposite the valve lever circumference of bead over

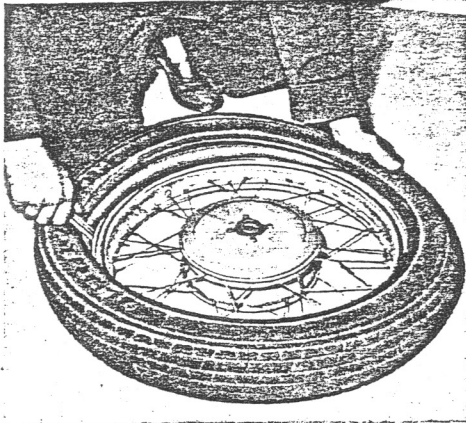
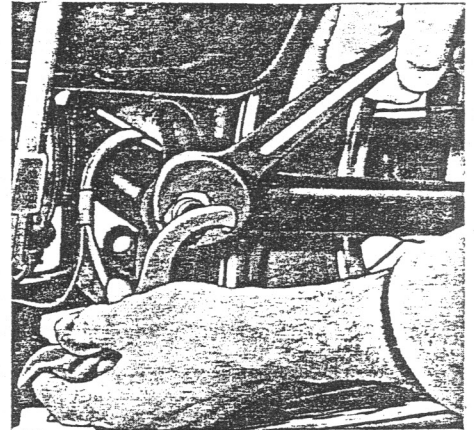
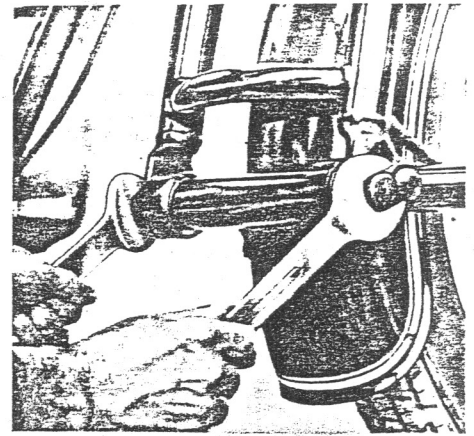


the rim flange without using undue force. Dust inside of cover with talcum powder, slip slightly inflated tube into the cover, thread the valve through the valve hole in the rim and screw on rim nut a few turns. Drop second bead near the valve into the well and fit in place alike as before. Inflate to recommended pressure, make sure that the cover is evenly fitted all round and tighten rim nut securely. When refitting, replace the tire into its original position with respect to the rim and with the red spot at the valve position.

Swing fork pivot bearings, front and rear. Every 3,750 miles check the pivot bearings for freedom of play and adjust them, if necessary.

To adjust the pivot bearings of front fork slacken the cap nut (24 mm.) on left side of motorcycle and tighten the pivot on its hexagon head (24 mm.) at right side and tighten cap nut again so that the swing fork without wheel moves slowly down by its own weight by about 50° out of horizontal position.

To adjust the pivot bearing of rear swing fork unscrew the cap nuts (36 mm.) on either side, slacken the locknuts (27 mm.) and tighten the pivot by means of the pin spanner supplied in the tool kit, and then slacken back a bit in order to release the load from the bearings. Retighten locknuts and cap nuts as well. The bearing clearance between swing fork and frame should be equal at either side. These adjustments are best accomplished in a BMW service station.



38 Subsequent Conversion of a Solo Motorcycle for Sidecar Operation — Warranty Conditions

Storing for Long Periods

If the motorcycle is to be put into storage for the winter or to be put out of service for a long period for any other reason, the following measures should be taken:

1. Close the fuel shut-off and drain fuel from the float chamber by removing the fuel hose from carburetor.
2. Change the oil in the crankcase, if possible.
3. Thoroughly clean and dry the motorcycle. The brake linkages, kickstand bearings, and the hinges for the mudguard and the tool box cover.
4. Treat all polished and chrome-plated steel parts with acid-free grease and, if possible, spray the motorcycle with protective oil. Wipe lacquered parts with a soft rag.
5. Block up the motorcycle on its stand in a dry room (a slightly acid atmosphere, as in a stable, causes corrosion) so that there is no weight on the inflated tires.
6. Using a sprayer thrust clear through the spark plug hole, treat the cylinder, with the piston near bottom dead center, with protective oil (engine rust inhibitor oil SAE 20), once with the intake valve open and once with the exhaust valve open. Then turn the engine over several times with the kickstarter. Finally set the pistons at top dead center and screw in the plug.
7. Remove the battery, discharge it slowly every 8 weeks and then recharge. The draining of electrolyte will not protect the battery lead plates from corrosion.

Subsequent Conversion of a Solo Motorcycle for Sidecar Operation

The subsequent modification of a solo motorcycle to accommodate a sidecar involves a number of technical changes which in every case should be reserved for a special BMW garage.

If the motorcycle is still within the warranty period, claims made under the guarantee conditions will be honored only if all the alterations described below and the attachment of the sidecar are carried out in accordance with the manufacturer's prescriptions.

The frame possesses fitting points for the mounting of the sidecar. The necessary attachment parts may be purchased from the factory. The following modifications are to be carried out:

1. Bevel gear set for sidecar operation in the rear-axle drive (No. of teeth 26:5).
2. Remove the earlier teeth numbers on bevel drive housing and stamp-on the new teeth figures.
3. Modified speedometer for sidecar operation (with ratio number 2.00).
4. Equip the rear suspension with springs for sidecar operation.
5. Set the swinging arm bearing of the front fork into the forward location on the fork.
6. Set the front wheel upper suspension mounting into the lower position on the fork.

7. Exchange the "solo" handlebar (25.6") against that for sidecar operation (26.8").
8. Connect the sidecar in accordance with the manufacturer's prescriptions.

Warranty Conditions

1. BMW guarantees, in accordance with contemporary technical standards, all factorynew BMW vehicles and all BMW replacement parts against defects in materials and/or workmanship. The guarantee period extends for the first 6,200 miles (10,000 km.), or a maximum period of six months, beginning from the date of delivery of the new vehicle and/or part(s) to the original purchaser. As regards the BMW replacement parts which are purchased and installed by a BMW contract dealer or service station, the guarantee period will, in compliance with the stipulations covering the execution of operations on vehicles and their component parts in BMW automotive service stations, extend for the first 1,800 miles (3,000 km.) or a maximum period of two months after acceptance of the vehicle.

A claim under such warranty shall be considered only if it is entered with a BMW dealer immediately upon discovery of the defect. Purchaser's claim under such guarantee shall be valid if a defect has been established; but purchaser shall not have the right to claim cancellation of the purchase contract or a reduction in the purchase price.

2. BMW reserves the right to implement the guarantee either by repair or by replacement of the defective part or parts. Any repair work under such warranty shall be carried out at a place to be determined by BMW with due consideration of the interest of the purchaser.
3. If BMW recognizes the claim under such warranty, BMW shall assume the cost of the least expensive mode of shipment and the appropriate costs of the repair, provided that the work is performed by BMW or by a BMW contract dealer. Any part or parts shall be replaced which are defective either in material or workmanship, as well as any part or parts which have been derivatively damaged as a direct consequence of such defect. Parts which have been replaced shall revert to BMW.
4. For parts which are not manufactured by BMW itself, such as tires, electrical equipment, etc., BMW will, in the event of defects, assign its claims against the manufacturer of such parts to the owner of the vehicle and/or parts under this warranty, thereby absolving itself of any further responsibility.
5. No compensation for any direct or indirect damage shall be made. This warranty shall not include routine wear or any damage caused by negligence or inappropriate handling.
6. The warranty shall be invalidated if the vehicle to which it applies has been altered by unauthorized persons or by the installation of parts of other than BMW manufacture, and if the damage is a direct or indirect consequence of

such alterations. The warranty shall further be invalidated if the owner of the vehicle has not complied with the instructions given in the BMW operating manual, or of the inspections specified in the BMW maintenance schedule have not been properly executed.

In the interests of technical development, BMW reserves the right to change specifications, design and equipment without notice. Dimensional, weight and performance data shall be understood as including customary tolerances.

Lubrication and Maintenance Schedule

Free Maintenance Inspection I (at 300 miles)

1. Change engine oil.
2. With engine cold, check cylinder head retaining bolts for the specified torque (25.3 ft. lbs.) and retighten, if necessary.
3. Subsequently check valve clearance and adjust if necessary. (Intake 0.006", Exhaust 0.008").

Free Maintenance Inspection II (at 1000 miles)

Same operations as prescribed for the minor maintenance. The items mentioned under point 10 regarding the lubrication of the centrifugal advance unit and the breaker cam lubricating felt are not necessary. However, the following additional jobs are to be achieved..

1. When changing the engine oil, remove oil pan, clean oil pan and oil screen.
2. Change transmission oil.
3. Change oil in rear-wheel drive.
4. On motorcycles equipped with light-metal-rims (optional equipment) check the wheel spokes for uniform tension and, if necessary, retighten spokes and center the rims.
5. With engine cold, check cylinder head retaining bolts for the specified torque (25.3 ft. lbs.) and retighten if necessary.
6. Subsequently check valve clearance and adjust if necessary. (Intake 0.006", Exhaust 0.008").

Periodic lubrication

(at the following mileages: 2,000, 4,000, 6,000, 8,000, 10,000 and so on).

1. Change engine oil.
2. Lubricate front and rear swing-arm pivot bearings (Use only a hand operated grease gun).
3. Oil control levers, brake and clutch linkage, as well as the hinge on the rear wheel fender (mudguard) and the saddle suspension.

40 Lubrication and Maintenance Schedule

4. Check the electrolyte level in the battery and top up with distilled water if required, eventually at a lower mileage.

Minor maintenance

(at the following mileages 4,000, 8,000, 12,000, 16,000, 20,000, 24,000, 28,000 and so on.)

1. Periodic lubrication.
2. Check oil level in transmission and top up if necessary.
3. Check the oil level in rear-wheel drive and top up if necessary.
4. Check air intake filter cartridge — Carefully tap off any dust which may have accumulated in the filter element (on no account wash it out), renew the cartridge when clogged.
5. Check steering, wheel bearings, front and rear swing-arm pivot bearings for play.
6. Check bolts and nuts for tightness, particularly the axle spindle nuts and the pertaining clamp screws, suspension unit retaining bolts, front and rear, attachment of transmission to engine, cylinder flange nuts etc. Caution! Tighten axle spindle nuts without applying tommy bar.
7. Check and adjust the play in the control cables as required; if necessary remove and grease throttle twist grip.
8. Check spark plugs and gap settings (0.028").
9. Check contact breaker gap (0.016"), lubricate bearing bushing of centri-

fugal advance unit and breaker lubricating felt with Bosch grease Ft 1v4, and check that the felt rests properly on the cam.

10. Check ignition timing.
11. Clean carburetor and the screen filter in the fuel shut-off.
12. With engine cold, check cylinder head retaining bolts for the specified torque (25.3 ft. lbs.), and retighten if necessary.
13. Subsequently check valve clearance and adjust if required (Intake 0.006", Exhaust 0.008").
14. Carry out the final check, together with test for driving safety (tires, tire pressure, brakes, steering, lighting system) and adjust carburetor idling if necessary.

Major Maintenance

(at the following mileage: 16,000, 32,000, 48,000, 64,000 etc.)

1. Minor maintenance, but additionally, carry out the following:
2. Remove oil pan, when changing engine oil, clean oil pan and screen.
3. Change oil in transmission.
4. Change oil in rear wheel drive.
5. Remove, clean and repack the wheel bearings.
6. Check the wheel spokes for uniform tension; tighten spokes if necessary and center the rims. On motorcycles equipped with light metal rims (special equipment) this point 6 is to be accomplished every 8,000 miles.

7. Clean the brakes; check the brake drums, shoes, linings, cams and actuating parts.
8. Renew micronic air filter cartridge.
9. Clean generator of carbon dust, clean commutator and check it for smooth running surface; inspect brushes for wear and for smooth fit in the guides. If the motorcycle is operated under especially dusty conditions, this point 10 is to be accomplished every 8,000 miles.
10. Remove the complete rear wheel drive from the right swinging arm and repack the pinion coupler gear of the universal shaft with grease.

LUBRICANTS:

Engine: Brand name HD oils for Otto-cycle engines.

with outside temperatures of:

	Viscosity:
below 32°F	SAE 10 W 30
32°—86°F	SAE 30
over 86°F and for sports driving	SAE 40

Transmission: Brand name hypoid oil SAE 90

Rear wheel drive: Brand name hypoid oil SAE 90

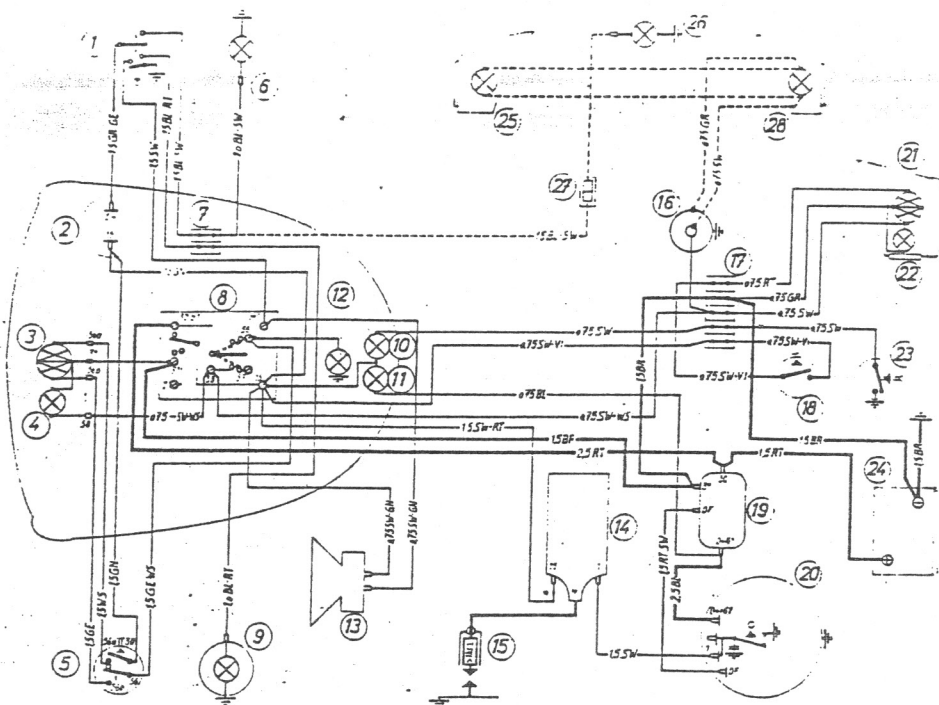
Contact breaker lubricating felt: Bosch VS 8102 — Ft grease

Bearing bushing for centrifugal advance unit: Bosch VS 8102 — Ft grease

Wheel hubs and other lubrication points: Brand-name "Multi-Purpose" grease with a melting point of 180°C (356°F)

**Key to Electrical Diagram:
6 V BMW R 27**

- 1 Blinker and horn switch
- 2 Flasher unit
- 3 Double-filament bulb
- 4 Parking light
- 5 Dimmer and headlight flasher switch
- 6 Right blinker
- 7 Cable connector (2-pole)
- 8 Ignition and light switch
- 9 Left blinker
- 10 Neutral indicator
- 11 Charging indicator
- 12 Speedometer lights
- 13 Horn
- 14 Ignition coil
- 15 Spark plugs adaptor
- 16 Electrical jack (socket)
- 17 Cable connector (5-pole)
- 18 Stoplight switch
- 19 Voltage regulator
- 20 Generator and contact breaker
- 21 Stop and tail light
- 22 License plate lights
- 23 Neutral indicator contact
- 24 Battery 6 Volt



Sidecar

- 25 Front side light
- 26 Blinker
- 27 Cable connector (1-pole)
- 28 Rear side light

Wiring color code: BL = blue, BR = brown,
GE = yellow, GN = green, GR = grey,
RT = red, SW = black, VI = violet, WS
= white.

For instance:
0.75 BR
= 0.75 sq.mm. brown.