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16	Kraftstoffbehälter und -leitungen	Fuel tank and lines	Réservoir à essence et conduites	Serbatoio e condutture carburante
18	Auspuffanlage	Exhaust system	Dispositif d'échappement	Impianto di scarico
21	Kupplung	Clutch	Embrayage	Frizione
23	Getriebe	Transmission	Boîte à vitesses	Cambio
26	Gelenkwelle	Drive shaft	Arbre de transmission	Albero di trasmissione
31	Vorderradgabel	Front fork	Fourche d'avant	Forcella anteriore
32	Lenkung	Steering	Direction	Sterzo
33	Hinterachse	Rear axle	Essieu arrière	Asse posteriore
34	Bremsen	Brakes	Freins	Freni
35	Fußbetätigung	Pedal assembly	Pédalier	Pedali
36	Räder und Bereifung	Wheels and tyres	Roues et pneumatiques	Ruote e pneumatici
46	Rahmen	Frame	Cadre	Telaio
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61	Allgemeine Fahrzeug-elektrik	General electrics	Châssis-électricité	Telaio-impianto elettrico
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72	Sonderausrüstung	Special equipment	Equipement spécial	Equipaggiamento speciale





00	Entretimiento e informes generales	Vård och allmänna hänvisningar	Onderhoud en algemene aanwijzingen
11	Motor	Motor	Motor
12	Motor-Equipo eléctrico	Motor-Elsystem	Motor-elektrisch
13	Alimentación de combustible y reglaje	Bränsletillförsel och justering	Benzinetoevoer en afstelling
16	Depósito de carburante y tubería	Bensintank och ledningar	Benzinetank en leidingen
18	Tubería de escape	Avgassystem	Uitlaatinstallatie
21	Embrague	Koppling	Koppeling
23	Caja de cambio	Växellåda	Versnellingsbak
26	Arbol articulado	Kardanaxlar	Cardanas
31	Horquilla delantera	Framgaffel	Voorwielvork
32	Dirección	Styrning	Stuurinrichting
33	Eje trasero	Bakaxel	Achteras
34	Frenos	Bromsar	Remmen
35	Pedales	Pedaler	Pedalen
36	Ruedas y neumáticos	Hjul och däckutrustning	Wielen en banden
46	Cuadro	Ram	Frame
52	Asiento doble	Säten	Duozaad
61	Instalación eléctrica	Fordonets elsystem Chassi elsystem	Elektrische Installatie
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63	Luces	Lampor	Lampen
71	Equipo de a bordo	Utrustningdelar	Boorogereedschap
72	Equipo especial	Special-utrustning	Speciaal uitrusting

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# ● Work Time Rates

## Motorcycles

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R 60/6 - R 75/6 - R 90/6 - R 90 S

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**BMW Motorrad GmbH**



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# INTRODUCTION

## General remarks

These works information sheets contain a summary of all work time rates (WT) for our motorcycle models. They are an important prerequisite for a company's own fixed price repairs and for the settlement of warranty claims.

The advantages of the consistent use of the Work Time catalogue are:

- Exactness in the wording of orders
- Quick preparation of invoices
- Precalculation (quotations)
- Planning completion times
- Calculating profitability when planning the installation of plant
- Flat rate standards (calculation of incentive pay)

## Layout of the Work Time Catalogue

The Work Time Catalogue is arranged under main headings in the same order as the Service Information and Parts Catalogues.

Similarly, the part descriptions of the text or works orders and costings is similar to that of the parts department.

After every group catalogue section there is a group index and, in addition, there is, before every group, a summary of possible associated work connected with major test work.

## Main and Associated Jobs

**Main jobs** are self-contained operations that begin with the acceptance of the order by the mechanic and end with its return.

**Associated jobs** make it possible to extend main jobs.

Each associated job appears in the catalogue only once (except in the summaries of Test jobs). It appears in the group with which it is best associated from a technical or functional viewpoint.

**Example:**

Main job	11 12 232	Overhaul both cylinder heads complete
Associated job	712	Overhaul both cylinder heads complete (cylinder heads removed)

The associated job 11 12 712 — Overhaul both cylinder heads complete (cylinder heads removed) can, for example, be given to the service foreman for the main job 11 12 090 — Remove and refit both cylinder heads.

Main jobs are identifiable by the last 3 numbers in the job number being between 000 and 499 while, with associated jobs, they are between 500 and 999.

## Job Numbers

The job numbers have seven figures and comprise a 2 figure main group, a two figure sub group and a 3 figure serial number.

Example:	Main job:	Remove and refit engine	11	00	050
	Ass. job:	Remove and refit or replace chain tensioner	11	31	630
		in which there is:			
	Main job	(engine 11)			
	Sub job	(engine complete 00)			
		(control 31)			
		Serial number 050 and 630			

## Job Descriptions

The scope of jobs is shown, where necessary, by the details given under "includes" but no attempt is made to give a complete description of the working operations, for which reference should be made to the Repair Instructions and Service Information Sheets. Only from these can complete technical descriptions be taken.

Necessary associated work, such as visual inspection, greasing, oiling or cleaning of parts or assemblies is included within the scope of jobs.

With job positions which differ only in the number of parts, the "includes" text is given only once.

Example:	11 24 000	Remove and refit or replace left or right connecting rod
		includes: Removal and refitting cylinder. Removal and refitting/cleaning and measuring of connecting rod and bearing shells.
	11 24 030	Removal and refitting or replacement of both connecting rods

Here either the left or right-hand part is to be taken out or replaced under a single position in the text and in another position they are both to be done together.

In such a case the service foreman should note in the order e.g. left or right, as is appropriate.

## Workshop Efficiency

The work time units (WT) given against each job position are times required for one job relative to another and so it is necessary for every workshop to determine the average number of WT's they can achieve in a working hour. For this it is necessary to take approx. 10 time checks for each of 20 frequently performed job positions.

From the average times for each of these time checks the WT per hour achieved for each of these 20 job positions can then be calculated. And from the average of these time checks the number of WT achieved per hour can be seen.

The average for these 20 job positions then gives the performance rating for the workshop and from this performance rating you can work out a factor (see example), with the help of which all the work time rates given in the catalogue can be converted to working times.

The price to be charged for repairs per WT is determined when your hourly selling price is divided by the performance rating for your workshop (e. g. = 12 WT).

With this factor the rate of DM 2.00 in our example can be quickly and accurately determined as the price to be charged for each of the group of operations covered by the job positions in our work time rates Catalogue.

**Brief Example for the Calculation of Performance Rating:**  
(Three of the 20 most common job positions)

23 00 052	Overhaul transmission	47 WT
11 14 151	Replace crankshaft radial sealing ring	36 WT
11 24 000	Remove and refit or replace left or right connecting rod	28 WT

Job No.	23 00 052	11 14 151	11 24 000
Work time rate acc. to catalogue	47 WT	36 WT	28 WT
approx. 10 time determinations  *strike out times which differ widely from average	4.3 h	2.5 h	2.3 h
	4.0 h	3.2 h	2.0 h
	4.0 h	3.5 h	2.5 h
	5.8 h	2.8 h	2.1 h
	3.6 h	2.2 h	1.8 h
	3.9 h	4.9 h	2.0 h
	5.7 h	3.7 h	2.6 h
	3.6 h	4.0 h	2.2 h
	4.2 h	2.7 h	1.7 h
	3.7 h	3.1 h	2.8 h
divided by number of time determinations = average time	31.3 h : 8 = 3.91 h	27.7 h : 9 = 3.08 h	22.0 h : 10 = 2.20 h
Achieved WT per hour	47 WT : 3.91 h = 12.02 WT/h	36 WT : 3.08 h = 11.7 WT/h	28 WT : 2.20 h = 12.7 WT/h

Average value:  $12.02 + 11.7 + 12.7 = 36.4 : 3 = 12.1 \text{ WT/h}$   
Performance rating (based on average) 12 WT/h

Calculation factor:  $1 \text{ WT} = \frac{1 \text{ h}}{12 \text{ WT}} = 0,084 \text{ h}$

$\frac{60 \text{ min}}{12 \text{ WT}} = 5 \text{ min.}$

Working time	47 WT x 0.084 = 3.91 h	36 WT x 0.084 = 3.02 h	28 WT x 0.084 = 2.35 h
With an hourly rate of, for example, 24.00 DM the price per WT = $\frac{24.00 \text{ DM}}{12 \text{ WT}} = 2.00 \text{ DM/WT}$			
Price to charge for repairs	47 WT x 2.00 = 94.00 DM	36 WT x 2.00 = 72.00 DM	28 WT x 2.00 = 56.00 DM

If any questions should arise, as a result of your experience, concerning this work time rates Catalogue, please contact BMW Motorrad GmbH, Service Department.







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00 Maintenance		R 60/6	a) R75/6 b) R90/6	R 90 S	
00 00 009	Free-of-charge handover inspection (without vehicle cleaning)	19	20	20	
00 00 119	1st upkeep operation at 1,000 km	29	30	30	
00 00 139	BMW upkeep operation every 7,500 km	30	31	31	
00 00 149	BMW inspection every 15,000 km	51	51	51	
00 00 199	Engine inspection includes all necessary work e.g. engine oil and oil filter element replacement, removal, cleaning and replacement of oil sump and oil screen. Cleaning of air filter element and both carburetors. Checking tightness of engine, oil sump, exhaust, cylinder and cylinder head nuts and screws. Adjust valve clearance. Check spark plugs, adjust ignition timing. Adjust clutch free travel, engine idle speed and petrol-air mixture.	25	25	25	
00 11 209	Change oil in engine with filter	4	4	4	
00 11 219	Change oil in engine without filter	2	2	2	
00 11 229	Change oil in gearbox	2	2	2	
00 11 279	Change oil in telescopic forks	5	5	5	
00 11 289	Change oil in rear wheel gear	2	2	2	
00 11 299	Change oil in rear swing arm	2	2	2	
00 11 459	Clean motorcycle	AZ	AZ	AZ	
00 11 469	Wash engine	AZ	AZ	AZ	
00 12 159	Inspection according to § 29 StVZO	AZ	AZ	AZ	
00 12 209	Give estimate for accident repairs	AZ	AZ	AZ	



## 11 ENGINE

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11 Engine		R 60/6	a) R75/6 b) R90/6	R 90 S	
11 00 009	<b>Diagnosis with engine tester</b> Includes: Battery voltage, contact resistance, dwell angle and engine timing, performance comparison (dynamic compression) check charging current and ignition condenser, check ignition coils earth connection, ignition coils primary and secondary winding.  <b>Associated work:</b> 11 00 539 Check compression 12 11 514 Adjust dwell angle and ignition timing 12 11 601 Replace contact breaker points 12 11 641 Replace ignition condenser 12 12 511 Replace all spark plugs 12 12 531 Replace one ignition lead 12 12 541 Replace all ignition leads 12 12 571 Replace one ignition lead connector 12 12 581 Replace all ignition lead connectors 12 13 501 Replace one ignition coil 12 31 521 Replace generator 13 00 604 Adjust engine idle speed and petrol/air mixture 61 12 501 Positive battery lead replacement 61 12 511 Negative battery lead replacement 61 21 519 Battery recharging	9	9	9	
		2	2	2	
		2	2	2	
		6	6	6	
		1	1	1	
		1	1	1	
		1	1	1	
		1	1	1	
		1	1	1	
		1	1	1	
		3	3	3	
		2	2	2	
		4	4	4	
		1	1	1	
		6	6	6	

<b>11 Engine</b>		<b>R 60/6</b>	<b>a) R75/6 b) R90/6</b>	<b>R 90 S</b>	
<b>11 00 039</b>	<b>Test compression</b> includes: Removal and refitting of spark plugs	3	3	3	
<b>539</b>	<b>Test compression</b> (job No. 11 00 009)	2	2	2	
<b>11 00 050</b>	<b>Engine removal and reinstallation</b> includes: Removal and refitting of petrol tank, transmission and exhaust system. Clean motor externally. Check and top-up engine oil. Adjust engine idle speed and petrol/air mixture.	43	43	43	
<b>11 00 051</b>	<b>Install replacement engine</b> includes: Removal and installation of engine, filling with engine oil, preparing old engine for dispatch.	53	53	53	
<b>11 00 103</b>	<b>Engine dismantling and reassembly</b> includes: Removal and reinstallation of the engine, fitting engine into and removing engine from assembly stand, sump removal and refitting, removal, replacement and cleaning of oil screen and suction bell, removal, replacement and cleaning of flywheel, removal and refitting of chain case cover and both cylinders. Cleaning of parts and checking for wear. Measuring both cylin- ders and pistons, all bearings, both main bearing bushings and connecting rod bearings. Measure and adjust axial play of the crankshaft.	144	144	144	
<b>603</b>	<b>Dismantle and reassemble engine</b> (loose engine)	101	101	101	
<b>11 11 001</b>	<b>Replace engine housing</b> includes: Removal and refitting of engine, fitting engine in and taking engine out of assembly stand. Removal and refitting of oil sump, removal, cleaning and refitting of oil screen and suction tube. Removal and refitting of flywheel and chain case cover. Removal and refitting/ cleaning of both cylinders. Cleaning parts and checking for wear. Measuring both cylinders and pistons, all crankshaft bearings and all connecting rod bearings. Measuring and adjusting axial play of the crankshaft. Punching in engine number.	141	141	141	

<b>11 Engine</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>11 11 050</b>	<b>Removal and reinstallation or replacement of left or right cylinder</b> includes: Removal, cleaning and replacement of cylinder. Measuring cylinders and pistons. Adjusting valve clearance. Adjusting engine idle speed and petrol/air mixture.	23	23	23	
<b>700</b>	<b>Removal, reinstallation or replacement of left or right cylinder</b>	13	13	13	
<b>11 11 061</b>	<b>Replace left or right cylinder foot and cylinder head gasket</b> includes: Removal, cleaning and reinstallation of cylinder. Measuring cylinder and piston. Adjusting valve clearance. Adjusting engine idle speed and petrol/air mixture.	23	23	23	
<b>711</b>	<b>Replacing cylinder head and cylinder foot gaskets right or left (loose engine)</b>	13	13	13	
<b>11 11 120</b>	<b>Removal and reinstallation or replacement of both cylinders</b> includes: Removal and installation/clean sealing surfaces of both cylinders. Measure cylinder and piston. Adjust valve clearances. Adjust motor idle speed and petrol/air mixture.	30	30	30	
<b>740</b>	<b>Remove, reinstall or replace both cylinders</b>	23	23	23	
<b>11 11 131</b>	<b>Replace both cylinder head and cylinder base gaskets</b> includes: Remove and replace/clean sealing surfaces of both cylinders. Measure cylinders and pistons. Adjust valve clearances. Adjust motor idle speed and petrol/air mixture.	30	30	30	
<b>751</b>	<b>Replace both cylinder head and cylinder base gaskets (loose engine)</b>	23	23	23	
<b>11 12 009</b>	<b>Tighten cylinder head bolts</b> includes: Removal and reinstallation/sealing both cylinder head covers. Adjust valve clearances.	8	8	8	
<b>11 12 030</b>	<b>Removal and reinstallation/sealing or replacement of left or right cylinder head cover</b>	3	3	3	

<b>11 Engine</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>11 12 050</b>	<b>Removal and reinstallation/sealing or replacement of both cylinder head covers</b>	5	5	5	
<b>11 12 070</b>	<b>Removal and reinstallation of left or right cylinder head</b> includes: Removal and replacement/cleaning and sealing of cylinder head. Adjust valve clearance. Adjust motor idle speed and petrol/air mixture.	22	22	22	
<b>11 34</b>					
<b>560</b>	<b>Remove and install or replace one valve</b> (cylinder head removed)	3	3	3	
<b>570</b>	<b>Remove, install or replace two valves</b> (cylinder head removed)	6	6	6	
<b>600</b>	<b>Remove and replace all valves</b> (cylinder head removed)	12	12	12	
<b>11 12 071</b>	<b>Replacement of left or right cylinder head gaskets</b> includes: Removal and refitting/cleaning and sealing of cylinder head. Adjusting valve clearance. Adjusting motor idle speed and petrol/air mixture.	22	22	22	
<b>11 12 090</b>	<b>Remove and refit both cylinder heads</b>	30	30	30	
<b>11 12 091</b>	<b>Replace both cylinder head gaskets</b>	30	30	30	
<b>11 12 123</b>	<b>Dismantle and reassemble left or right cylinder head and grind all valves</b> includes: Removal and replacement of both valves. Grinding both valves. Checking both valves for tightness.	28	28	28	
<b>513</b>	<b>Dismantle and reassemble one cylinder head and grind all valves.</b> (cylinder head complete removed)	6	6	6	
<b>11 12 143</b>	<b>Dismantle and reassemble both cylinder heads and grind all valves</b>	42	42	42	
<b>523</b>	<b>Dismantle and reassemble both cylinder heads and grind all valves</b> (cylinder head complete removed)	12	12	12	



<b>11 Engine</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>11 12 157</b>	<b>Dress all valve seats and valves</b> includes: Removal, replacement, dismantling and reassembly of both cylinder heads.	54	54	54	
<b>537</b>	<b>Dress two valve seats</b> (cylinder head dismantled)	5	5	5	
<b>557</b>	<b>Dress all valve seats</b> (cylinder head dismantled)	10	10	10	
<b>11 12 181</b>	<b>Replace left or right cylinder head</b> includes: Removal and installation of left or right cylinder head. Grinding both valves. Checking both valves for tightness.	28	28	28	
<b>660</b>	<b>Remove and replace left or right cylinder head and/or replace cylinder head gasket</b> (loose engine)	13	13	13	
<b>680</b>	<b>Remove and replace both cylinder heads and/or replace cylinder head gaskets</b> (loose engine)	23	23	23	
<b>11 12 201</b>	<b>Replace both cylinder heads</b>	54	54	54	
<b>11 12 212</b>	<b>Overhaul left or right cylinder head complete</b> includes: Removal, dismantling, reassembly and refitting of left or right cylinder head. Dressing valve seats. Planishing cylinder head sealing surfaces.	44	44	44	
<b>682</b>	<b>Overhauling left or right cylinder head complete</b> (cylinder head removed)	22	22	22	
<b>11 12 232</b>	<b>Overhaul both cylinder heads compl.</b>	70	70	70	
<b>712</b>	<b>Overhaul both cylinder heads compl.</b> (cylinder heads removed)	44	44	44	
<b>11 12 ...</b>					
<b>739</b>	<b>Planish sealing surfaces of one cylinder</b> (cylinder head dismantled)	2	2	2	
<b>749</b>	<b>Planish sealing surfaces of both cylinder heads</b> (cylinder heads dismantled)	3	3	3	

<b>11 Engine</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>11 13 000</b>	<b>Removal and reinstallation/sealing or replacement of oil sump</b> includes: Engine oil draining and filling.	9	9	9	
<b>500</b>	<b>Removal and refitting/sealing or replacement of oil sump (loose engine)</b>	8	8	8	
<b>11 41 ...</b>					
<b>65Q</b>	<b>Remove and reinstall or replace suction bell of oil pump (oil sump removed)</b>	1	1	1	
<b>11 14 000</b>	<b>Remove and reinstall or replace motor protective cover</b>	3	3	3	
<b>11 14 031</b>	<b>Replace starter cover panel</b> includes: Remove and refit petrol tank. Fit new type emblems.	4	4	4	
<b>11 14 060</b>	<b>Remove and replace/seal chain case cover</b> includes: Remove and replace exhaust system complete. Adjust contact gap and ignition timing.	25	25	25	
<b>651</b>	<b>Replace radial seal for crankshaft sealing in chain case cover (chain case cover removed)</b>	1	1	1	
<b>671</b>	<b>Replace radial sealing ring for camshaft sealing (chain case cover removed)</b>	1	1	1	
<b>691</b>	<b>Replace radial sealing ring for tachometer drive (chain case cover removed)</b>	1	1	1	
<b>11 41 ...</b>					
<b>603</b>	<b>Dismantle and reassemble oil pressure relief valve (chain case cover removed)</b>	2	2	2	
<b>11 14 061</b>	<b>Replace chain case cover</b> includes: Removal and refitting of chain case cover	27	27	27	
<b>11 14 071</b>	<b>Replace air intake scoop and/or filter for air intake scoop</b>	2	2	2	
<b>11 14 151</b>	<b>Replace crankshaft radial sealing ring (clutch side)</b> includes: Removal and reinstallation of transmission. Removal, cleaning and installation of flywheel.	36	36	36	

<b>11 Engine</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
11 15 101	Replace engine breather hose (on breather dome)	4	4	4	
11 15 111	Replace membrane valve for engine breather	4	4	4	
11 21 001	Replace crankshaft includes: Removal and replacement of engine, engine in assembly stand, sump, flywheel and chain case cover. Removal, cleaning and refitting of both cylinders. Cleaning parts and checking for wear. Measuring all bearings on crankshaft, both main bearing bushings and connecting rod bearings. Measuring and adjusting axial play of the crankshaft. Replacing all gaskets and similar spoiled parts.	151	151	151	
531	Replace all crankshaft main bearings (engine dismantled)	7	7	7	
601	Replace toothed ball bearing on the front of the crankshaft (chain case cover removed)	2	2	2	
11 22 000	Removal and reinstallation or replacement of flywheel includes: Removal and replacement of transmission	35	35	35	
11 24 000	Remove and refit or replace left or right connecting rod includes: Removal and refitting cylinder. Removal and refitting/cleaning and measuring of connecting rod and bearing shells	28	28	28	
11 24 030	Removal and refitting or replacement of both connecting rods	42	42	42	
531	Replace one connecting rod bearing shell (engine dismantled and/or connecting rod taken out)	2	2	2	
541	Replace all connecting rod bearing shells (engine dismantled and/or connecting rod taken out)	3	3	3	
601	Replace one connecting rod small end bush (connecting rod taken out)	7	7	7	
611	Replace both connecting rod small end bushes (connecting rods taken out)	14	14	14	

<b>11 Engine</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>11 25 000</b>	<b>Remove and refit or replace all pistons</b> includes: Remove and replace both cylinders. Measure cylinders, pistons and connecting rod small end bushes.	33	33	33	
651	Replace piston rings on one piston (piston taken out)	2	2	2	
671	Replace piston rings on all pistons	3	3	3	
<b>11 31 001</b>	<b>Replace camshaft and/or flange bearing for camshaft</b> includes: Removal and refitting of engine. Fixing engine into and removing engine from assembly stand. Removal and refitting of flywheel, chain case cover and both cylinders.	112	112	112	
630	Removal and refitting or replacement of chain tensioner complete	1	1	1	
<b>11 31 061</b>	<b>Replace chain wheel set</b> includes: Removal and refitting of engine. Fitting engine into and removing engine from assembly stand, removal and refitting of flywheel, chain case cover and both cylinders.	111	111	111	
630	Removal and refitting of chain tensioner complete	1	1	1	
<b>11 31 080</b>	<b>Remove and refit or replace chain tensioner complete</b> includes: Removal and refitting of chain case cover	26	26	26	
<b>11 31 001</b>	<b>Replace one pushrod left or right</b> includes: Adjust valve clearance.	8	8	8	
<b>11 32 041</b>	<b>Replace both pushrods left or right</b> includes: Adjust valve clearance.	9	9	9	
<b>11 32 061</b>	<b>Replace all pushrods</b> includes: Adjust valve clearance.	12	12	12	
<b>11 32 100</b>	<b>Remove and refit or replace tappet and/or exhaust valve left or right</b> includes: Removal and refitting of cylinder.	23	23	23	



<b>11 Engine</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
11 32 140	Remove and refit or replace both tappets left or right includes: Removal and refitting of cylinder	23	23	23	
11 32 160	Remove and refit or replace all tappets includes: Removal and refitting of both cylinders	32	32	32	
11 33 200	Replace one rocker arm shaft and/or one rocker arm for inlet or exhaust valve left or right includes: Adjust valve clearances.	11	11	11	
11 33 240	Remove and refit or replace both rocker arm shafts and/or both rocker arms left or right includes: Adjust valve clearances.	13	13	13	
11 33 280	Remove and refit or replace all rocker arm shafts, all rocker arms includes: Adjust valve clearances.	23	23	23	
11 34 004	Adjust valve clearances	5	5	5	
11 34 100	Remove and refit or replace valve springs for inlet and/or exhaust valves left or right includes: Removal and refitting of cylinder head left or right	25	25	25	
607	Dress one (two) valve cones (valves removed)	1	1	1	
11 34 250	Remove and refit or replace both valve springs left or right	28	28	28	
11 34 170	Remove and refit or replace all valve springs	42	42	42	
637	Dress all valve cones	2	2	2	
11 41 000	Remove and refit or replace oil pump includes: Remove and refit transmission. Clean engine housing. Check and top-up engine oil.	39	39	39	
11 42 090	Remove and refit/seal or replace cover (outer) for full flow oil filter includes: Check and, if necessary, top-up engine oil.	2	2	2	





## 12 ENGINE ELECTRICS

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12 00 Check Ignition System . . . . .	12 – 1
11 Ignition Timing Adjustment . . . . .	– 1
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12 Spark Plugs . . . . .	– 1
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32 Regulator Cutout . . . . .	– 3
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Starter Dismantle/Reassemble . . . . .	– 3



<b>12 Engine Electrics</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
12 00 009	Check ignition system (with engine tester) includes: Battery, spark p ugs, both ignition coils, ignition leads and ignition lead connectors for insulation and continuity, check ignition condenser. Adjust contact gap and ignition timing.	12	12	12	
12 11 004	Adjust ignition timing includes: Check and adjust contact breaker contacts.	5	5	5	
12 11 130	Remove and refit or replace centrifugal advance includes: Check and adjust contact breaker points. Adjust ignition timing.	6	6	6	
12 11 141	Replace contact breaker points includes: Adjust contact breaker points and ignition timing.	8	8	8	
601	Replace contact breaker points (engine protective cover removed)	6	6	6	
12 11 169	Check ignition condenser (with engine tester)	4	4	4	
641	Replace ignition condenser (motor protective cover removed)	1	1	1	
12 11 171	Replace ignition condenser	3	3	3	
12 12 009	Check spark plugs includes: Adjust electrode gap	3	3	3	
12 12 011	Replace all spark plugs includes: Check and, if necessary, adjust electrode gaps.	2	2	2	
511	Replace all spark plugs (for job No. 11 00 009)	1	1	1	
12 12 019	Check ignition leads and ignition lead connectors (with engine tester)	3	3	3	

<b>12 Engine Electrics</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>12 12 021</b>	<b>Replace one ignition lead</b> includes: Removal and refitting of fuel tank.	3	3	3	
<b>531</b>	<b>Replace one ignition lead</b> (for job No. 11 00 009)	1	1	1	
<b>12 12 041</b>	<b>Replace all ignition leads</b> includes: Removal and replacement of fuel tank.	4	4	4	
<b>541</b>	<b>Replace all ignition leads</b>				
<b>12 12 071</b>	<b>Replace one ignition lead connector</b>	1	1	1	
<b>571</b>	<b>Replace one ignition lead connector</b> (for job No. 11 00 009)	1	1	1	
<b>12 13 089</b>	<b>Test both ignition coils (with engine tester)</b>	5	5	5	
<b>12 13 100</b>	<b>Remove and refit or replace left or right ignition coil</b>	3	3	3	
<b>501</b>	<b>Replace one ignition coil</b> (for job No. 11 00 009)	1	1	1	
<b>12 31 009</b>	<b>Test generator and regulator cutout</b> includes: Connecting and disconnecting test apparatus	5	5	5	
<b>12 31 020</b>	<b>Remove and refit or replace generator</b> includes: Loosen and fasten horn and motor protective cover.	6	6	6	
<b>521</b>	<b>Replace generator</b> (for job No. 11 00 009)	3	3	3	
<b>12 31 170</b>	<b>Remove and refit or replace diode carrier of the generator</b> includes: Loosen and fasten horn and engine protective cover.	4	4	4	
<b>670</b>	<b>Remove and refit or replace diode carrier</b> (motor protective cover removed)	2	2	2	

<b>12 Engine Electrics</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>12 31 201</b>	<b>Replace carbon brushes in generator</b> includes: Loosen and fasten horn and motor protective cover.	10	10	10	
<b>551</b>	<b>Replace carbon brushes</b> (generator frame removed)	5	5	5	
<b>569</b>	<b>Skim sliprings</b> (rotor removed)	1	1	1	
<b>12 32 000</b>	<b>Remove and refit or replace regulator cutout for generator</b> includes: Removal and refitting of petrol tank.	3	3	3	
<b>12 41 020</b>	<b>Remove and refit or replace starter</b> includes: Removal and refitting of petrol tank. Loosening and refastening horn and motor protective cover.	8	8	8	
<b>12 41 041</b>	<b>Replace magnetic engagement switch</b> includes: Removal and replacement of starter.	10	10	10	
<b>12 41 103</b>	<b>Dismantle and reassemble starter</b> includes: Removal and replacement of starter and magnetic switch. Cleaning parts and checking for wear. Checking operation.	17	17	17	



## 13 FUEL SYSTEM

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Piston-Membrane . . . . .	- 1
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<b>13 Fuel Cleaning and Control</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>13 00 004</b>	<b>Adjust engine idle speed and petrol/air mixture</b> includes: Synchronizing both carburetors and adjusting both accelerator cables.	4	4	4	
<b>604</b>	<b>Adjust engine idle speed and petrol/air mixture</b> (for job No. 11 00 009)	2	2	2	
<b>13 10 004</b>	<b>Adjust float level in both carburetors</b> includes: Removal and refitting of both carburetors.	10	10	10	
<b>13 10 009</b>	<b>Clean both carburetors</b> includes: Removal and refitting of both carburetors. Adjusting engine idle speed and petrol/air mixture.	15	15	15	
<b>13 10 080</b>	<b>Remove and refit left or righthand carburetor</b> includes: Adjusting engine idle speed and petrol/air mixture.	5	5	5	
<b>13 10 100</b>	<b>Remove and refit/replace both carburetors</b> includes: Adjust engine idle speed and petrol/air mixture.	8	8	8	
<b>13 10 110</b>	<b>Remove and refit/replace nozzle needle for left or righthand carburetor</b> includes: Adjust engine idle speed and petrol/air mixture.	4	5	4	
<b>13 10 130</b>	<b>Remove and refit/replace nozzle needle for both carburetors</b> includes: Adjust engine idle speed and petrol/air mixture.	5	6	5	
<b>13 10 231</b>	<b>Replace membrane on piston for left or right carburetor</b> includes: Adjust engine idle speed and petrol/air mixture.	—	6	—	
<b>13 10 251</b>	<b>Replace membrane on piston of both carburetors</b> includes: Adjust engine idle speed and petrol/air mixture.	—	8	—	
<b>13 10 260</b>	<b>Remove and refit/seal or replace float chamber for left or righthand carburetor</b>	2	2	2	

<b>13 Fuel Cleaning and Control</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>13 10 280</b>	Remove and refit/seal or replace float chamber of both carburetors	2	2	2	
<b>13 10 290</b>	Remove and refit/replace float for left or righthand carburetor includes: Remove and refit carburetor.	7	7	7	
<b>13 10 310</b>	Remove and refit/replace float for both carburetors includes: Remove and refit carburetors.	10	10	10	
<b>13 10 321</b>	Replace float needle in left or righthand carburetor	7	7	7	
<b>13 10 341</b>	Replace float needles in both carburetors	10	10	10	
<b>13 10 350</b>	Remove and refit/replace choke housing on left or righthand carburetor includes: Remove and refit carburetor.	6	6	6	
<b>13 10 370</b>	Remove and refit/replace choke housing on both carburetors includes: Remove and refit carburetors.	8	8	8	
<b>13 11 ...</b>					
<b>562</b>	Overhaul one carburetor (carburetor removed)	4	5	4	
<b>13 23 004</b>	Adjust both Bowden cables for choke operation	2	2	2	
<b>13 23 041</b>	Replace left or righthand bowden cable for choke operation includes: Removing and fitting Bowden cable to choke lever. Adjusting Bowden cable.	5	5	5	
<b>13 23 080</b>	Remove and refit/replace choke control complete (with Bowden cables) includes: Removing and refitting both Bowden cables on choke lever and both carburetors. Adjusting both Bowden cables.	4	4	4	
<b>13 72 000</b>	Remove and refit/replace air filter element	3	3	3	





## 16 FUEL TANK AND PIPING

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Rubber Support . . . . .	– 1
12 Fuel Cock . . . . .	– 1
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Fuel hose . . . . .	– 1

<b>16 Petrol Tank and Fuel Hoses</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
16 00 009	Clean complete fuel system includes: Removing and refitting petrol tank. Cleaning both carburetors.	13	13	13	
16 11 009	Clean petrol tank includes: Removing and refitting petrol tank.	6	6	6	
16 11 030	Remove and refit petrol tank	2	2	2	
16 11 031	Replace petrol tank includes: Removing and refitting petrol tank.	8	8	8	
16 11 271	Replace both rubber buffers securing petrol tank includes: Removing and refitting petrol tank.	3	3	3	
16 11 281	Replace rubber support bracket for petrol tank front includes: Removing and refitting petrol tank.	4	4	4	
16 11 291	Replace rubber support beneath petrol tank includes: Removing and refitting petrol tank.	4	4	4	
16 12 150	Remove and refit or replace left or right fuel cock	3	3	3	
16 12 180	Remove and refit/clean right or left fuel screen	2	2	2	
16 12 251	Replace fuel hose (from fuel cock to carburetor) left or right	2	2	2	
16 12 281	Replace fuel hose (between dividing piece left and right)	3	3	3	
16 12 301	Replace all fuel hoses	4	4	4	
16 12 311	Replace dividing piece for fuel hoses right or left	1	1	1	



## 18 EXHAUST SYSTEM

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31 Gear Shift Fork . . . . .	- 2
Shifting Mechanism Complete . . . . .	- 2
41 Foot Change Pedal . . . . .	- 2

<b>23 Mechanical Transmission</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>23 00 020</b>	<b>Remove and refit transmission</b> includes: Removal and refitting of transmission on engine flange. Cleaning transmission externally. Checking oil level and topping up, if necessary.	23	23	23	
<b>23 00 030</b>	<b>Fit rebuilt transmission</b> includes: Removal and refitting transmission. Filling new transmission with oil.	24	24	24	
<b>23 00 052</b>	<b>Overhaul transmission</b> includes: Removal and refitting of transmission. Draining and refilling gear oil. Fitting transmission in and removing from assembly stand. Removal and refitting of bearing stand for gearshift discs. Removal and refitting/measuring of complete set of gears. Dismantle and reassemble drive shaft, driven shaft and gearshift mechanism (bearing) complete. Replace all bearings and sealing rings.	47	47	47	
<b>23 11 001</b>	<b>Replace transmission housing</b> includes: Removal and refitting of transmission. Removal and refitting of transmission housing cover and replacing gasket. Removal and refitting/measuring complete set of gears. Removal and refitting bearing stand for gearshift discs and shaft with gearshift forks.	35	35	35	
<b>23 11 040</b>	<b>Remove and replace/seal transmission housing cover</b> includes: Removal and refitting of transmission. Draining and refilling gear oil. Fitting transmission in and removing from assembly stand.	32	32	32	
<b>23 12 . . .</b>					
<b>541</b>	<b>Replace radial seal ring on driven shaft</b> (transmission housing cover removed)	1	1	1	
<b>23 12 011</b>	<b>Replace radial sealing ring on drive shaft</b> includes: Removal and replacement of transmission.	23	23	23	
<b>501</b>	<b>Replace radial seal ring on drive shaft</b> (loose transmission)	1	1	1	
<b>23 12 051</b>	<b>Replace radial sealing ring or driven flange</b> includes: Removal and replacement of transmission.	31	31	31	
<b>531</b>	<b>Replace radial seal ring for driven flange</b> (loose transmission)	8	8	8	

<b>23 Mechanical Transmission</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>23 12 111</b>	<b>Replace radial seal ring for foot change shaft</b> includes: Removal and refitting of foot change pedal.	2	2	2	
<b>611</b>	<b>Replace radial seal ring for foot change shaft</b> (loose transmission)	1	1	1	
<b>23 21 001</b>	<b>Replace drive flange for transmission</b> includes: Removal and refitting of transmission.	26	26	26	
<b>23 21 101</b>	<b>Replace toothed ball bearings on all gear shafts</b> includes: Removal and replacement of transmission. Removal and replacement of transmission housing cover.	41	41	41	
<b>23 22 001</b>	<b>Replace complete set of gears</b> includes: Removal and replacement of transmission. Removal and replacement of transmission housing cover.	43	43	43	
<b>23 22 100</b>	<b>Remove and refit/replace speedometer drive pinion</b>	2	2	2	
<b>23 31 001</b>	<b>Replace gearshift forks</b> includes: Remove and refit transmission, transmission housing cover with gasket, bearing support for gearshift discs.	34	34	34	
<b>501</b>	<b>Replace all gearshift forks</b> (loose gear box)	9	9	9	
<b>23 31 303</b>	<b>Dismantle and reassemble gearshifting mechanism (gearshift lever) complete</b> includes: Removal and refitting of transmission, transmission housing cover with gasket.	33	33	33	
<b>23 41 300</b>	<b>Remove and refit/replace foot change pedal</b>	1	1	1	



## 26 PROPELLER SHAFT

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26 11 Propeller Shaft (Cardan Shaft) Complete . . . . .	26 - 1
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26 Propeller Shaft	R 60/6	a) R 75/6 b) R 90/6	R 90 S	
26 11 000 Remove and refit or replace propeller shaft (cardan shaft) complete includes: Removal and refitting of rear wheel gear. Cleaning rear swing arm. Balance and set rear swing arms. Grease both swing arm bearings.	20	20	20	
26 11 140 Remove and refit or replace coupling bell on propeller shaft (cardan shaft) rear includes: Removal and refitting of rear wheel gear.	14	14	14	





## 31 FRONT AXLE

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31 Front Axle		R 60/6	a) R75/6 b) R90/6	R 90 S	
31 42 009	Measure telescopic fork	41	41	41	
31 42 050	Remove and refit/replace steering shock absorber	3	3	3	
31 42 100	Remove and refit telescopic fork	25	25	25	
31 42 103	Dismantle and reassemble telescopic fork	38	38	38	
701	Replace lower fork bridge (telescopic fork dismantled)	12	12	12	
31 42 112	Overhaul telescopic fork	54	54	54	
31 42 131	Replace fork sliding tube left or right	13	13	13	
31 42 151	Replace both fork sliding tubes	15	15	15	
31 42 200	Replace left or right fork stand tube	38	38	38	
31 42 221	Replace both fork stand tubes	39	39	39	
31 42 250	Remove and refit or replace both shock absorbers in the telescopic fork	18	18	18	
31 42 321	Replace both tapered roller bearings for the telescopic fork support	31	31	31	
721	Replace both tapered roller bearings for the telescopic fork support (telescopic fork taken out)	11	11	11	
31 42 361	Replace cup for sealing fork sliding tube left or right	13	13	13	
31 42 381	Replace both cups for sealing fork sliding tubes	15	15	15	
31 42 391	Replace sealing ring for sliding tube bottom screw coupling left or right	6	6	6	
821	Replace sealing ring for sliding tube bottom screw coupling left or right (telescopic fork taken out)	4	4	4	





## 32 STEERING

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73 Clutch Cable . . . . .	- 2
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<b>32 Steering</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>32 00 454</b>	<b>Adjust steering</b> includes: Removing and replacing petrol tank.	4	4	4	
<b>32 32 000</b>	<b>Remove and refit or replace steering lock</b>	3	3	3	
<b>32 71 000</b>	<b>Remove and refit or replace handlebar</b> includes: Loosening and tightening cable clamps left and right. Switch on swivel pieces left and right, removing and refitting clamp supports on handlebar. Removing and refitting both swivel pieces left and right on handlebar and pulling tight. Checking operation of the electrical equipment. Adjusting clutch free play.	7	7	7	
<b>32 72 001</b>	<b>Replace handlebar grips left or right</b>	2	2	2	
<b>32 72 021</b>	<b>Replace both handlebar grips</b>	3	3	3	
<b>32 72 040</b>	<b>Remove and refit or replace hand clutch lever</b> includes: Removing and refitting clutch cable above and below. Setting clutch free play.	3	3	3	
<b>32 72 050</b>	<b>Remove and refit or replace swivel piece with hand clutch lever complete</b> includes: Removing and refitting clutch cable above and below, swivel piece on handlebar, clutch switch in swivel piece. Check function of electrical equipment. Adjust clutch free play.	5	5	5	
<b>32 72 061</b>	<b>Replace swivel piece for hand clutch lever</b> includes: Removing and refitting swivel piece with hand clutch lever, hand clutch lever on swivel piece.	6	6	6	
<b>32 72 080</b>	<b>Remove and refit or replace hand brake lever</b> includes: With R 75/6 – R 90/6 – R 90 S: Removing and refitting petrol tank. Adjust hand brake at brake cylinder includes with R 60/6: Adjusting hand brake Bowden cable	3	4	4	

32 Steering	R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>32 72 100</b> Remove and refit or replace throttle twist grip with handbrake cable complete includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting petrol tank, brake cable on brake cylinder, handbrake lever and brake cable from swivel piece. Loosening and retightening swivel piece and throttle twist grip on handlebar. Removing and refitting mirror. Adjusting handbrake at brake cylinder. includes with R 60/6: Removing and refitting handbrake cable above and below.		6	6	
<b>32 72 131</b> Replace grip tube with handlebar grip for throttle cable operation includes: Adjusting cam for throttle cable operation.	3	3	3	
<b>32 72 141</b> Replace cam for throttle cable operation includes: Setting motor idle speed and petrol/air mixture, cam for the throttle cable.	5	5	5	
<b>32 73 000</b> Remove and refit or replace clutch cable	4	4	4	
<b>32 73 010</b> Remove and refit or replace handbrake cable includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting petrol tank. Checking handbrake adjustment. includes with R 60/6: Adjusting Bowden cable at the brake lever of the front wheel brake, Bowden cable at the handbrake lever and swivel piece.	4	4	4	
<b>32 73 030</b> Remove and refit or replace throttle cable for carburetor left or right includes with R 60/6 – R 90 S: Removing and refitting petrol tank. Removing and refitting throttle cable. Adjusting motor idle speed and petrol/air mixture. includes with R 75/6 – R 90/6: Removing and refitting petrol tank. Removing and refitting cable on the carburetor cover and removing the throttle cable on the choke lever. Adjusting motor idle speed and petrol/air mixture.	8	7	8	



32 Steering	R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<p><b>32 74 050</b>    Remove and refit or replace both throttle cables for carburetors</p> <p>includes with R 60/6 – R 90 S: Removing and refitting petrol tank. Removing and refitting throttle cable. Adjusting motor idle speed and petrol/air mixture.</p> <p>includes with R 75/6 – R 90/6: Removing and refitting petrol tank. Removing and refitting cable on the carburetor cover and removing the throttle cable on the choke lever. Adjusting motor idle speed and petrol/air mixture.</p>	10	9	10	



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<b>33 Rear Axle</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>33 10 050</b>	<b>Remove and refit rear wheel drive</b> includes: Draining and refilling oil from rear swing arm. Removing and refitting rear wheel.	9	9	9	
<b>33 10 051</b>	<b>Replace rear wheel drive complete</b> includes: Removing and refitting rear wheel drive, both rear wheel brake-shoes, brake lever on brake key and brake key in cardan housing.	12	12	12	
<b>33 10 052</b>	<b>Overhaul rear wheel drive</b> includes: Removal and refitting of rear wheel drive, cardan housing cover and bevel drive gear (pinion). Replacing taper roller bearing and needle bearing or bevel drive gear and toothed roller bearing and needle bearing for bevel gear. Adjusting torsional backlash of bevel gear and taking contact pattern. Determining and adjusting axial play of bevel gear.	63	63	63	
<b>33 11 401</b>	<b>Replace cardan housing</b> includes: Removing and refitting rear wheel drive, cardan housing cover and bevel drive gear (pinion). Determining installation dimension of bevel drive gear and setting bevel drive gear. Adjusting torsional backlash of bevel gear and taking contact pattern. Determining and adjusting axial play of bevel gear.	56	56	56	
<b>33 11 410</b>	<b>Removing and refitting/sealing cardan housing cover</b> includes: Removing and refitting rear wheel drive. Draining and refilling oil in rear wheel drive. Removing, refitting and sealing cardan housing cover.	14	14	14	
<b>33 11 411</b>	<b>Replace cardan housing cover gasket</b> includes: Removing and refitting rear wheel drive and cardan housing cover. Determining and adjusting axial play of bevel gear.	16	16	16	
<b>33 12 051</b>	<b>Replace bevel drive gear (pinion) with bevel gear</b> includes: Removing and replacing rear wheel drive, cardan housing cover and bevel drive gear (pinion). Determining installation dimension of bevel drive gear and setting bevel drive gear. Determining axial backlash of bevel gear and taking contact pattern. Determining and adjusting axial play of bevel gear.	59	59	59	

<b>33 Rear Axle</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>33 12 101</b>	<b>Replacing coupling hub on bevel drive gear for rear wheel drive</b> includes: Removing and refitting gear wheel drive. Removing and refitting both rear wheel brake blocks and brake lever. Removing and refitting brake key in cardan housing.	14	14	14	
<b>33 12 111</b>	<b>Replace shaft seal ring for coupling hub of rear wheel drive</b> includes: Removing and refitting rear wheel drive. Draining and refilling oil in rear wheel drive. Removing and refitting both rear wheel brake blocks, brake lever on brake key and brake key on cardan housing.	15	15	15	
<b>611</b>	<b>Replace shaft sealing ring for coupling hub of rear wheel drive</b> (rear wheel drive taken out)	6	6	6	
<b>631</b>	<b>Replace shaft sealing ring for bevel gear sealing in cardan housing cover</b>	6	6	6	
<b>33 12 131</b>	<b>Replace shaft seal ring for bevel gear sealing in cardan housing cover</b> includes: Removing and refitting rear wheel drive. Draining and refilling oil in rear wheel drive. Removing and refitting both rear wheel brake-shoes, brake lever on brake key and brake key in cardan housing.	15	15	15	
<b>33 12 151</b>	<b>Replace shaft sealing ring for bevel gear sealing in cardan housing</b> includes: Removing and refitting rear wheel drive. Draining and refilling oil in rear wheel drive. Removing and refitting both rear wheel brake-shoes, brake lever on brake key and brake key in cardan housing.	16	16	16	
<b>651</b>	<b>Replace shaft seal ring for bevel gear sealing in cardan housing cover</b> (rear wheel drive taken out)	7	7	7	
<b>33 12 171</b>	<b>Replace taper roller bearing for drive bevel gear support</b> includes: Removing and refitting rear wheel drive. Dismantling and reassembling rear wheel drive.	39	39	39	
<b>681</b>	<b>Replace needle bearing for bevel drive gear support</b> (bevel drive gear support complete taken out)	7	7	7	
<b>691</b>	<b>Replace tapered roller bearing and needle bearing for bevel drive gear support</b> (bevel drive gear complete taken out)	12	12	12	

<b>33 Rear Axle</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
33 12 . . .					
721	Replace toothed roller bearing and needle bearing for bevel gear support (bevel gear complete taken out)	4	4	4	
33 17 350	Remove and refit complete rear swing arm includes: Removing and refitting rear wheel drive, brake pedal complete with pull rod and propeller shaft at gear drive flange and left-hand spring strut. Adjust rear swing arm and set bearing. Grease both swing arm bearings.	17	17	17	
851	Replace rear swing arm (rear swing arm taken out)	8	8	8	
33 17 361	Replace both shaft seal rings for rear swing arms includes: Removal and refitting rear swing arms complete and both pressure sleeves for tapered roller bearings.	19	19	19	
33 17 381	Replace both tapered roller bearings for rear swing arm includes: Removing and refitting rear swing arm complete, both pressure casings for tapered roller bearings and shaft sealing rings.	22	22	22	
881	Replace both tapered roller bearings on rear swing arms (rear swing arms taken out).	5	5	5	
33 17 391	Replace seal between rear swing arm and cardan housing includes: Draining and refilling oil in rear swing arm. Removing and refitting rear wheel, cardan housing on rear swing arm and rear wheel drive complete.	9	9	9	
33 17 401	Replace rubber bellows between gear and rear swing arm	8	8	8	
901	Replace rubber bellows between gear and rear swing arm (rear swing arm taken out)	1	1	1	
33 52 021	Replace both rear shock absorbers includes: Removing and refitting both spring strut shock absorbers complete.	7	7	7	
33 52 100	Remove and refit left or right rear spring strut shock absorber	3	3	3	

<b>33 Rear Axle</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>33 52 120</b>	Remove and refit both rear spring strut shock absorbers	5	5	5	
<b>33 52 271</b>	Replace one (both) silent block(s) for rear spring strut shock absorbers	5	5	5	
<b>33 52 291</b>	Replace both silent blocks on rear spring strut shock absorbers	10	10	10	
<b>33 53 101</b>	Replace left or right lug for rear spring strut shock absorber complete includes: Removing and refitting rear spring strut shock absorber complete	5	5	5	
<b>33 53 121</b>	Replace both spring strut lugs for rear spring strut shock absorbers includes: Removing and refitting rear spring strut shock absorbers complete	9	9	9	
<b>33 53 131</b>	Replace left or right bellows covering for rear spring strut shock absorber includes: Removing and refitting rear spring strut shock absorber complete.	5	5	5	
<b>33 53 151</b>	Replace both bellows coverings for rear spring strut shock absorbers includes: Removing and refitting rear spring strut shock absorbers complete.	8	8	8	
<b>33 53 160</b>	Remove and refit/replace adjustment gear for left or right rear spring strut shock absorber Includes: Removing and refitting rear spring strut shock absorber complete.	5	5	5	
<b>33 53 180</b>	Remove and refit/replace adjustment gear for both rear spring strut shock absorbers includes: Removing and refitting rear spring strut shock absorber complete.	9	9	9	





## 34 BRAKES

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<b>34 Brakes</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>34 00 021</b>	<b>Renew brake fluid in brake system</b> includes with R 75/6 – R 90/6 – R 90 S only: Removing and refitting petrol tank. Bleeding brake caliper(s), filling with brake fluid.	—	4	4	
<b>34 00 046</b>	<b>Bleed brakes</b> includes with R 75/6 – R 90/6 – R 90 S only: Removing and refitting petrol tank. Fill with brake fluid.	—	3	3	
<b>34 10 114</b>	<b>Adjust front wheel brake</b> includes: with R 75/6 – R 90/6 – R 90 S: Removing and replacing petrol tank. Adjusting cable assembly on the cylinder with gauge. Testing operation. with R 60/6: Adjust knurled screws for cable adjustment, eccentric adjusting bolts and handbrake cable.	2	4	5	
<b>34 10 124</b>	<b>Adjust rear brake</b>	2	2	2	
<b>34 10 134</b>	<b>Adjust front and rear brakes</b>	2	5	5	
<b>34 10 159</b>	<b>Clean and adjust front brake</b> includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting front wheel and brake pads. Cleaning caliper(s). Checking freedom of movement in brake plunger. Adjust caliper(s). includes with R 60/6: Removing and refitting front wheel. Checking handbrake rod for freedom of movement.	5	4	6	

<b>34 Brakes</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>34 10 169</b>	<b>Clean and adjust rear brake</b> includes: Removing and refitting rear wheel. Checking foot brake operation for ease of movement.	4	4	4	
<b>34 10 179</b>	<b>Clean and adjust front and rear brakes</b> includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting front and rear wheels. Adjusting brake caliper(s). Cleaning and adjusting rear brake.  includes with R 60/6: Checking Bowden cable for ease of movement. Adjusting front and rear brakes.	9	8	9	
<b>34 11 000</b>	<b>Removing and refitting or replacing brake pads in one or both disc brakes</b> includes: Removing and refitting front wheel. Removing, refitting and greasing bolts (eccentric). Adjusting brake caliper (front brake). Testing operation.	–	4	6	
<b>34 11 012</b>	<b>Overhauling front brake (R 60/6)</b> includes: Removing and refitting front wheel. Removing and refitting brake cable on brake lever and nipple holder. Removing and refitting front brake bracket complete and brake cable. Removing and refitting both brake-shoes and brake-shoe safety rings. Mark position of brake lever on brake key and remove and refit. If necessary, replace both brake-shoes and other parts.	15	–	–	
<b>34 11 020</b>	<b>Remove and refit or replace front brake fixed caliper left or right</b> includes: Removing and refitting caliper on sliding tube. Bleeding brake. Adjusting brake pads.	–	5	–	
<b>34 11 040</b>	<b>Remove and refit or replace both front brake fixed calipers</b> includes: Removing and refitting caliper on sliding tube. Bleeding brake. Adjusting brake pads.	–	–	6	

<b>34 Brakes</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>34 11 101</b>	<b>Replace front brake bracket</b> includes: Removing and refitting front brake bracket complete.	12	—	—	
<b>34 11 150</b>	<b>Remove and refit or replace both brake-shoes of front brake</b> includes: Removing and refitting front wheel.	8	—	—	
<b>740</b>	<b>Remove and refit or replace both brake-shoes of front brake (front wheel taken out)</b>	4	—	—	
<b>34 11 169</b>	<b>Check brake ring in front wheel for out of true</b> includes: Removing and refitting front wheel.	6	—	—	
<b>769</b>	<b>Check brake ring in front wheel for out of true (front wheel taken out)</b>	2	—	—	
<b>34 11 ...</b>					
<b>779</b>	<b>Turn out brake ring in front wheel hub (front wheel taken out)</b>	9	—	—	
<b>34 11 200</b>	<b>Remove and refit or replace front brake disc left or right</b> includes: Removing and refitting front wheel. Adjusting brake pads on front brake.	—	5	—	
<b>34 11 220</b>	<b>Remove and refit or replace both front brake discs</b> includes: Removing and refitting front wheel. Adjusting brake pads on front brake.	—	—	7	
<b>34 21 032</b>	<b>Overhaul rear brake</b> includes: Removing and refitting rear wheel. Removing and refitting both brake blocks and springs. Cleaning all parts and checking for wear. Checking brake ring in rear hub for out-of-true. Replacing both brake blocks in rear brake.	11	11	11	
<b>34 21 150</b>	<b>Remove and refit or replace both brake blocks in rear brake</b> includes: Removing and refitting rear wheel. Cleaning both brake blocks. Replacing brake block springs.	5	5	5	
<b>540</b>	<b>Remove and refit or replace both brake blocks in rear brake (rear wheel or rear wheel drive taken out)</b>	2	2	2	

<b>34 Brakes</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>34 21 169</b>	<b>Check brake ring in rear wheel hub for out-of-true</b> includes: Removing and refitting rear wheel.	5	5	5	
<b>959</b>	<b>Check brake ring in rear wheel hub for out-of-true</b> (rear wheel taken out)	2	2	2	
<b>34 21 ...</b>					
<b>969</b>	<b>Turn out brake ring in rear wheel hub</b> (rear wheel taken out)	9	9	9	
<b>34 31 000</b>	<b>Remove and refit or replace main brake cylinder</b> includes: Removing and refitting petrol tank, brake cylinder on frame and brake switch. Bleed brakes. Fill with brake fluid. Check operation.	—	7	7	
<b>34 31 111</b>	<b>Replace brake light switch</b> includes: Removing and refitting petrol tank. Checking operation.	—	3	3	
<b>34 31 161</b>	<b>Replace cover for brake fluid container</b> includes: Removing and refitting petrol tank. Checking operation.	—	3	3	
<b>34 32 381</b>	<b>Replace front brake hose</b> includes: Removing and refitting petrol tank. Bleeding brakes. Filling with brake fluid and checking for leaks.	—	4	—	
<b>34 32 401</b>	<b>Replace both brake hose</b> includes: Removing and refitting petrol tank. Bleeding brakes. Filling with brake fluid and checking for leaks.	—	—	5	
<b>34 32 201</b>	<b>Replace front brake tubing</b> includes: Bleeding brakes. Filling with brake fluid and checking for leaks.	—	4	—	
<b>34 32 221</b>	<b>Replace tubing for both front brakes</b> includes: Bleeding brakes. Filling with brake fluid and checking for leaks.	—	—	5	



## 35 FOOT OPERATION

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<b>35 Foot Operation</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>35 21 000</b>	<b>Remove and refit or replace brake pedal</b> includes: Removing and refitting rod on brake pedal, ring and pressure spring. Greasing foot brake pedal and adjusting height of brake pedal. Adjusting foot brake. Adjusting brake light switch.	4	4	4	
<b>35 21 101</b>	<b>Replace pivot bolts for foot brake pedal</b> includes: Removing and refitting pull-rod on brake pedal, ring and pressure spring. Greasing foot brake pedal. Adjusting foot brake.	3	3	3	
<b>35 21 111</b>	<b>Replace grease nipple in pivot bolts for foot brake pedal</b> includes: Greasing foot brake pedal.	1	1	1	
<b>35 21 120</b>	<b>Remove and refit or replace pull-rod for foot brake</b> includes: Greasing foot brake pedal. Adjusting foot brake.	3	3	3	
<b>35 21 131</b>	<b>Replace pressure spring on pull-rod for foot brake</b> includes: Adjusting foot brake.	2	2	2	





## 36 WHEELS

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<b>36 Wheels</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>36 30 008</b>	<b>Balance front wheel (statically)</b> includes: Removing foreign bodies and mounting wheel in and taking out of balancing gear.	7	6	6	
<b>508</b>	<b>Balance front wheel (statically)</b> (wheel taken out)	3	3	3	
<b>36 30 018</b>	<b>Balance rear wheel (statically)</b> includes: Removing foreign bodies and mounting wheel in and taking out of balancing gear.	7	7	7	
<b>518</b>	<b>Balance rear wheel (statically)</b> (wheel taken out)	3	3	3	
<b>36 30 028</b>	<b>Balance front and rear wheels (statically)</b> includes: Removing foreign bodies and mounting wheels in and taking out of balancing gear.	12	12	12	
<b>528</b>	<b>Balance front and rear wheels (statically)</b> (wheels taken out)	7	7	7	
<b>36 30 039</b>	<b>Recenter front wheel</b> includes: Removing and refitting front wheel. Mounting wheel in and taking out of balancing gear. Check brake ring for out-of-true.	13	12	12	
<b>539</b>	<b>Recenter front wheel</b> (wheel taken out)	10	10	10	
<b>36 30 049</b>	<b>Recenter rear wheel</b> includes: Removing and refitting rear wheel. Mounting wheel in and taking out of balancing gear. Check brake ring for out-of-true.	12	12	12	
<b>549</b>	<b>Recenter rear wheel</b> (wheel taken out)	10	10	10	
<b>36 30 059</b>	<b>Recenter front and rear wheels</b> includes: Removing and refitting front and rear wheels. Mounting wheels in and taking out of balancing gear. Check brake rings for out-of-true.	25	25	25	
<b>559</b>	<b>Recenter front and rear wheels</b> (wheels taken out)	19	19	19	

<b>36 Wheels</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>36 30 300</b>	<b>Remove and refit front wheel</b> includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting linchpin with spacer.  includes with R 60/6: Removing and refitting brake torque arm and removing and refitting linchpin. Adjusting front brake.	4	3	3	
<b>36 30 320</b>	<b>Removing and refitting rear wheel</b> includes: Removing and refitting linchpin. Adjusting rear brake.	3	3	3	
<b>36 30 330</b>	<b>Removing and refitting front and rear wheels</b>	6	5	5	
<b>36 30 341</b>	<b>Replacing front wheel</b> includes: Removing and refitting front wheel. Adjust air pressure and check tube for leaks. Balance wheel statically.	12	11	11	
<b>601</b>	<b>Replace front wheel</b> (wheel taken out)	8	8	8	
<b>36 30 351</b>	<b>Replacing rear wheel</b> includes: Removing and refitting rear wheel. Adjust air pressure and check tube for leaks. Balance wheel statically.	11	11	11	
<b>611</b>	<b>Replace rear wheel</b> (wheel taken out)	8	8	8	
<b>36 30 361</b>	<b>Replacing front and rear wheel</b>	22	22	22	
<b>621</b>	<b>Replacing front and rear wheels</b> (wheels taken out)	16	16	16	
<b>36 31 061</b>	<b>Replace lipped sealing ring(s) for sealing front wheel bearings</b> includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting wheel. Adjusting wheel bearing play.  includes with R 60/6: Removing and refitting wheel. Removing and refitting bearing cover.	6	5	5	

<b>36 Wheels</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>36 31 071</b>	<b>Replace lipped sealing ring for sealing rear wheel bearings</b>  includes: Removing and refitting wheel. Removing and refitting bearing cover.	6	6	6	
<b>36 31 101</b>	<b>Replacing rim or spokes for front wheel</b>  includes: Removing and refitting wheel. Checking brake ring for out-of-true. Grinding down spokes. Mounting tyre and tube, checking air pressure and for leaks. Balancing wheel statically.	40	39	39	
<b>36 31 111</b>	<b>Replacing rim or spokes for rear wheel</b>  includes: Removing and refitting wheel. Checking brake ring for out-of-true. Grinding down spokes. Mounting tyre and tube, checking air pressure and for leaks. Balancing wheel statically.	40	40	40	
<b>36 31 201</b>	<b>Replace front wheel hub</b>  includes with R 75/6 – R 90 6 – R 90 S: Removing and refitting wheel. Removing and refitting/cleaning brake disc(s). Removing tyre and tube. Removing and refitting both sleeves with bearings. Greasing bearing. Removing and refitting both bearing rings. Centering rim. Grinding down spokes. Mounting tyre and tube. Balancing wheel statically. Adjusting brake pads. Adjusting wheel bearings.  includes with R 60/6: Removing and refitting wheel. Removing tyre and tube. Removing and refitting bearing pressure sleeve and, if necessary, reducing sleeve. Renewing grease filling. Removing old rim and fitting new rim to spokes. Mounting tyre and tube. Balancing wheel statically. Turning out brake ring to size.	52	44	44	
<b>36 31 211</b>	<b>Replacing wheel hub for rear wheel</b>	52	52	52	
<b>36 31 221</b>	<b>Replacing wheel hubs for front and rear wheels</b>	103	95	95	
<b>36 31 324</b>	<b>Adjust wheel bearing play in front wheel</b>  includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting wheel. Adjusting wheel bearings with friction meter.  includes with R 60/6: Removing and refitting wheel. Greasing bearings. Pre-loading bearings and checking bearing play	12	6	6	
<b>824</b>	<b>Adjust wheel bearing play in front wheel (wheel taken out)</b>	8	3	3	

<b>36 Wheels</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<b>36 31 334</b>	<b>Adjust wheel bearing play in rear wheel</b>	12	12	12	
<b>834</b>	<b>Adjust wheel bearing play in rear wheel</b>	8	8	8	
<b>36 31 344</b>	<b>Adjust wheel bearing play in front and rear wheels</b>	22	22	22	
<b>844</b>	<b>Adjust wheel bearing play in front and rear wheels (wheels taken out)</b>	17	12	12	
<b>36 31 351</b>	<b>Replace wheel bearings of front wheel</b> includes with R 75/6 – R 90/6 – R 90/7: Removing and refitting wheel. Adjusting wheel bearings. includes with R 60/6: Removing and refitting wheel. Preloading and adjusting wheel bearings.	13	6	6	
<b>36 31 361</b>	<b>Replace wheel bearings in rear wheel</b>	13	13	13	
<b>36 31 371</b>	<b>Replace wheel bearings in front and rear wheels</b>	25	18	18	
<b>36 32 001</b>	<b>Replace tyre for front wheel</b> includes: Removing and refitting wheel. Balancing wheel statically.	12	11	11	
<b>36 32 011</b>	<b>Replace tyre for rear wheel</b> includes: Removing and refitting wheel. Balancing wheel statically.	11	11	11	
<b>36 32 021</b>	<b>Replace tyres for front and rear wheels</b>	22	21	21	
<b>36 32 031</b>	<b>Replace inner tube for front wheel</b> includes: Removing and refitting wheel. Balance wheel statically.	11	10	10	
<b>36 32 041</b>	<b>Replace inner tube for rear wheel</b> includes: Removing and refitting wheel. Balance wheel statically.	10	10	10	
<b>36 32 051</b>	<b>Replace tubes for front and rear wheels</b>	20	19	19	



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<b>46 Frame</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>46 51 030</b>	<b>Remove and refit/replace frame front part</b> includes: Removal and refitting engine. Removal and refitting telescopic fork. Removal and refitting rear swing arm complete. (R 90 S: remove and refit cockpit enclosure.)	110	126	128	
<b>46 51 ...</b>					
<b>509</b>	<b>Measure frame front part</b> (frame front part removed)	AZ	AZ	AZ	
<b>46 51 ...</b>					
<b>519</b>	<b>Align frame front part</b> (frame front part removed)	AZ	AZ	AZ	
<b>46 51 050</b>	<b>Remove and refit/replace frame rear part</b>	16	16	16	
<b>46 51 080</b>	<b>Remove and refit/replace frame front and rear parts</b> includes: R 90 S — remove and refit cockpit enclosure	114	133	135	
<b>46 52 000</b>	<b>Remove and refit/replace motorcycle stand</b>	7	7	7	
<b>46 52 011</b>	<b>Replace one (both) spring(s) for motorcycle stand</b>	4	4	4	
<b>46 52 041</b>	<b>Replace buffer rubber for motorcycle stand and for side supports</b>	1	1	1	
<b>46 53 000</b>	<b>Remove and refit/replace side supports</b>	3	3	3	
<b>46 53 011</b>	<b>Replace springs for side supports</b>	3	3	3	
<b>46 61 000</b>	<b>Remove and refit or replace front mudguard</b>	4	4	4	
<b>46 61 020</b>	<b>Remove and refit/replace supporting stirrup for front mudguard</b>	2	2	2	
<b>46 62 000</b>	<b>Remove and refit or replace rear mudguard</b>	10	10	10	
<b>46 63 020</b>	<b>Remove and refit cockpit protection</b>	—	—	3	

46	Frame	R 60/6	a) R75/6 b) R90/6	R 90 S	
46 63 021	Replace cockpit protection includes: Removing and refitting cockpit protection. Removing and refitting voltmeter and clock.	—	—	6	
46 63 031	Replace windscreen for cockpit protection includes: Removal and refitting of cockpit protection.	—	—	5	
46 71 001	Replace engine securing bolts front	3	3	3	
46 71 011	Replace engine securing bolts rear	4	4	4	
46 71 030	Remove and refit front foot rest left or right complete	2	2	2	
46 71 050	Remove and refit both foot rests front complete	3	3	3	
46 71 061	Replace left/right front foot rest	4	4	4	
46 71 081	Replace both foot rests	6	6	6	
46 71 160	Remove and refit/replace left or right pillion foot rest complete	2	2	2	
46 71 180	Remove and refit/replace both pillion foot rests	2	2	2	

## 51 EQUIPMENT

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25	Seat Lock . . . . .	- 1
	Lock Cylinder . . . . .	- 1
	Replacement Lock . . . . .	- 1

<b>51 Equipment</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
51 14 070	Remove and refit/replace BMW plaque on petrol tank left or right	2	2	2	
51 14 090	Remove and refit/replace both BMW plaques on petrol tank	2	2	2	
51 14 201	Replace type emblem (on starter, cover hood) left or right	3	3	3	
51 14 221	Replace both type emblems (on starter, cover hood)	5	5	5	
51 16 490	Remove and refit/replace rearview mirror	2	2	2	
51 25 050	Remove and refit or replace seat lock	2	2	2	
51 25 060	Remove and refit or replace lock cylinder for seat lock	3	3	3	
51 25 081	Replace lock set (for steering lock and lock cylinder for seat lock)	5	5	5	



## 52 SEATS

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52 53 Double Seat . . . . .	52 — 1
Hinges for Double Seat . . . . .	— 1
Seat Cushion . . . . .	— 1
Frame for Seat Cushion . . . . .	— 1

52 Seats	R 60/6	a) R 75/6 b) R 90/6	R 90 S	
52 53 000 Remove and refit double seat includes: Removing and refitting hinge on front of seat.	4	4	—	
52 53 001 Replace double seat includes: Removing and refitting double seat.	4	4	—	
52 53 011 Remove and refit/replace seat cushion includes: Removing and refitting double seat.	—	—	6	
52 53 041 Replace hinge at front of double seat	3	3	—	
52 53 051 Replace hinge at back of double seat includes: Removing and refitting double seat	4	4	—	
52 53 061 Replace both hinges for double seat	4	4	—	
52 53 100 Remove and refit handgrip on double seat	2	2	—	
52 53 161 Replace center rubber for double seat cover	1	1	—	
52 53 381 Replace frame for seat includes: Removing and replacing seat cushion. Fixing BMW emblem and type shield.	—	—	11	





## 61 GENERAL VEHICLE ELECTRICS

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<b>61 General Vehicle Electrics</b>		R 60/6	a) R75/6 b) R90/6	R 90 S	
<b>61 00 009</b>	<b>Trouble shooting in electrical equipment</b>	AZ	AZ	AZ	
<b>61 11 050</b>	<b>Removal and refitting/replacement of the cable harness, engine section</b> includes: Removal and refitting of petrol tank. Loosening and tightening securing bands. Disconnecting and reconnecting cable.	9	9	9	
<b>61 11 060</b>	<b>Removing and refitting/replacing cable harness, frame section</b> includes: Removing and refitting petrol tank. Loosening and tightening securing bands. Disconnecting and reconnecting cable and pulling cable harness out of and into the rear part of the frame and checking for correct operation. (With R 90 S: Removing and refitting cockpit protection).	22	22	22	
<b>61 11 070</b>	<b>Removing and refitting/replacing cable harness, engine section and frame section</b>	27	27	27	
<b>61 12 001</b>	<b>Replace positive battery lead</b>	5	5	5	
501	<b>Replace positive battery lead</b> (for operation No. 11 00 009)	1	1	1	
<b>61 12 011</b>	<b>Replace negative battery lead</b>	2	2	2	
511	<b>Replace negative battery lead</b> (for operation No. 11 00 009)	1	1	1	
<b>61 12 201</b>	<b>Replace leads for front direction indicators</b> includes: Additionally with R 90 S Removing and refitting cockpit protection.	14	14	14	
<b>61 12 211</b>	<b>Replace leads for rear direction indicators</b>	7	7	7	
<b>61 20 009</b>	<b>Test battery (with engine tester)</b> includes: Connecting and disconnecting test apparatus.	3	3	3	
<b>61 20 029</b>	<b>Check level of distilled water in battery and top-up.</b>	3	3	3	
<b>61 21 010</b>	<b>Remove and refit battery</b>	6	6	6	

<b>61 General Vehicle Electrics</b>		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
61 21 011	Replace battery	7	7	7	
61 21 019	Recharge battery	8	8	8	
519	Recharge battery (for job No. 11 00 009)	6	6	6	
61 21 100	Remove and refit/replace battery bracket	7	7	7	
61 21 151	Replace battery acid drain-off	1	1	1	
61 31 000	Remove and refit/replace headlamp dip-switch includes: Removing and refitting headlight assembly. Disconnecting and reconnecting cables from cable harness in headlight body. Adjusting headlight and checking operation.	6	6	6	
61 31 010	Remove and refit/replace direction indicator switch	6	6	6	
61 31 280	Remove and refit/replace oil pressure switch	2	2	2	
61 31 295	Remove and refit/replace clutch switch	3	3	3	
61 31 300	Remove and refit/replace brake light switch (of handbrake) includes with R 75/6 – R 90/6 – R 90 S: Removing and refitting the petrol tank.	3	3	3	
61 31 304	Adjust brake light switch (of the foot brake)	2	2	2	
61 31 310	Remove and refit/replace brake light switch of the foot brake	3	3	3	
61 31 350	Remove and refit/replace blinker	2	2	2	
61 31 400	Remove and refit/replace headlamp relay	2	2	2	
61 32 000	Remove and refit/replace ignition switch	5	5	5	
61 33 000	Remove and refit/replace horn	2	2	2	



## 62 INSTRUMENTS

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	Bulb for Battery Charging Condition Tell Tale . . . . .	- 2
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	Bulb for Handbrake Tel Tale . . . . .	- 2
	Bulb for Neutral Position Tell Tale . . . . .	- 2
	Bulb for Speedometer Lighting . . . . .	- 2
	Bulb for Tachometer Lighting . . . . .	- 2
	Bulb for Instrument Lighting . . . . .	- 2
	Bulb for Clock Lighting . . . . .	- 2
	Bulb for Voltmeter Lighting . . . . .	- 2

62 Instruments	R 60/6	a) R75/6 b) R90/6	R 90 S	
62 11 200 Remove and refit/replace instrument combination includes: Removing and refitting speedometer shaft and tachometer shaft on instruments. Adjusting headlamp. Checking operation.	4	4	4	
62 12 000 Remove and refit/replace speedometer includes: Removing and refitting instrument combination. Checking operation.	6	6	6	
62 12 020 Remove and refit/oil or replace speedometer shaft includes: Removing and refitting petrol tank. Oiling speedometer shaft. Checking operation.	5	5	5	
62 12 031 Replace protective socket for speedometer shaft sealing (at gear end)	2	2	2	
62 13 000 Remove and refit/replace tachometer includes: Removing and refitting instrument combination. Checking operation.	6	6	6	
62 13 020 Remove and refit/replace drive shaft for tachometer includes: Removing and refitting motor protective hood. Loosening and tightening horn. Checking operation.	4	4	4	
62 13 031 Replace protective socket for tachometer shaft	4	4	4	
62 13 050 Remove and refit/replace clock includes: Removing and refitting cockpit protection.	—	—	4	
62 13 070 Remove and refit/replace voltmeter includes: Remove and refit cockpit protection.	—	—	4	

62 Instruments	R 60/6	a) R 75/6 b) R 90/6	R 90 S	
<p>62 99 001 Replace bulb for direction indicator tell tale</p> <p>62 99 011 Replace bulb for headlamp tell tale</p> <p>62 99 021 Replace bulb for battery charging tell tale</p> <p>62 99 031 Replace bulb for oil pressure tell tale</p> <p>62 99 061 Replace bulb for handbrake tell tale (only with R 75/6 – R 90/6 – R 90 S)</p> <p>62 99 091 Replace bulb for gear idle position tell tale</p> <p>62 99 111 Replace bulb for speedometer lighting</p> <p>62 99 121 Replace bulb for tachometer lighting</p> <p>62 99 181 Replace bulb for instrument lighting includes: Removing and refitting instrument combination. Removing and refitting bulb carrier. Testing operation.</p>	6	6	6	
<p>62 99 131 Replace bulb for clock lighting</p> <p>62 99 136 Replace bulb for voltmeter lighting</p>	–	–	3	





## 63 LIGHTS

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63 00	Check Operation of Lights . . . . .	63 - 1
12	Adjust Headlamp . . . . .	- 1
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13	Blinker Glass Front . . . . .	- 1
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99	Bulb for Parking Light . . . . .	- 2
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	Bulb for Blinker Light Front . . . . .	- 2
	Bulb for Blinker Light Rear . . . . .	- 2
	Bulb for Rear Light . . . . .	- 2

# 63 Lighting

		R 60/6	a) R75/6 b) R90/6	R 90 S	
63 00 009	Check operation of lighting equipment				
63 10 004	Adjust headlight	1	1	1	
63 12 090	Remove and refit headlight compl. includes: Removing and refitting lens and reflector. Disconnecting and reconnecting cable. Removing and refitting headlamp to bracket. Testing operation. Adjusting headlight. Additionally with R 90 S: Remove and refit cockpit protection.	2	2	2	
63 12 091	Replace headlamp complete includes: Removing and refitting headlamp. Removing and fitting contact plate. Additionally with R 90 S: Removing and refitting cockpit protection.	14	14	16	
63 12 380	Remove and refit/replace lens for headlamp includes: Adjusting headlamp. Checking operation.	15	15	15	
62 12 390	Remove and refit/replace reflector for headlamp	4	4	4	
63 12 460	Remove and refit or replace bracket headlamp unit includes: Adjusting headlamp. Checking operation.	4	4	4	
63 13 000	Remove and refit or replace front direction indicator glass left or right	4	4	4	
63 13 020	Remove and refit or replace both front direction indicator glasses	2	2	2	
63 13 150	Remove and refit or replace left or right direction indicator lamp complete	2	2	2	
63 13 170	Remove and refit or replace both front direction indicator lamps complete	2	2	2	
63 21 340	Remove and refit/replace glass for rearlight combination	3	3	3	
		2	2	2	

63 Lighting		R 60/6	a) R 75/6 b) R 90/6	R 90 S	
63 21 360	Remove and refit/replace lamp holder for rearlight combination	2	2	2	
63 21 380	Remove and refit or replace rearlight combination complete	5	5	5	
63 23 000	Remove and refit or replace rear direction indicator light glass left or right	2	2	2	
63 23 020	Remove and refit/replace both rear direction indicator light glasses	2	2	2	
63 23 150	Remove and refit/replace rear direction indicator light left or right	2	2	2	
63 23 170	Remove and refit/replace both rear direction indicator lights	3	3	3	
63 23 180	Remove and refit or replace rear direction indicator light bracket	7	7	7	
63 99 161	Replace bulb for front parking light	2	2	2	
63 99 241	Replace bulb for headlamp	3	3	3	
63 99 271	Replace bulb for front left or right direction indicator	2	2	2	
63 99 321	Replace bulb for left or right rear direction indicator	2	2	2	
63 99 381	Replace bulb for rearlight	2	2	2	



