

10 Automatic Gearbox

ZF 3 HP-12 B

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ZF Automatic Gearbox 3 HP – 12/B Specification

Fully automatic 3-speed gearbox with hydrodynamic torque converter

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|---------|-----------|-----------|----------|----------|
| Ratios: | Converter | 1-2.2 : 1 | 1st gear | 2.56 : 1 |
| | 2nd gear | 1.52 : 1 | 3rd gear | 1.0 : 1 |
| | Reverse | 2.0 : 1 | | |

Oil grade: Automatic Transmission Fluid Type A

Capacity: Approx. 4.75 litres (10.0 US pints or 8.4 Imp. pints) – initial filling.

Approx. 1.5 litres (3.2 US pints or 2.6 Imp. pints) at oil change

Output shaft ball bearing end float 0.05 mm (0.00197")

Multi-plate clutch body A, B end float 0.2 – 0.3 mm
(0.00787–0.01181")

Locating plate – circlip end float 0–0.15 mm
(0–0.00591") max.

Torque converter: BMW 1800 = green spot
BMW 2000 = white spot

Gearchange points:

| | BMW 1800 | BMW 2000 |
|----------------|------------------------------|------------------------------|
| 1st – 2nd gear | 45 – 50 kph (27 – 31 mph) | 45 – 55 kph (27 – 34 mph) |
| 2nd – 3rd gear | 85 – 90 kph (53 – 56 mph) | 85 – 95 kph (53 – 59 mph) |

Hydraulic pressure readings and connections for BMW 6042 tester

Converter oil pressure (1) Selector position 0, accelerator linkage detached, engine speed 1000 rpm = 1.6 atü (22.76 psi). Accelerator linkage in kickdown position (hand-held) = .35 atü (49.78 psi).

Clutch A (2) position A, accelerator linkage disconnected, handbrake on, footbrake operated, engine speed 1000 rpm = 5.0 – 5.3 atü (71.12 – 75.38 psi).

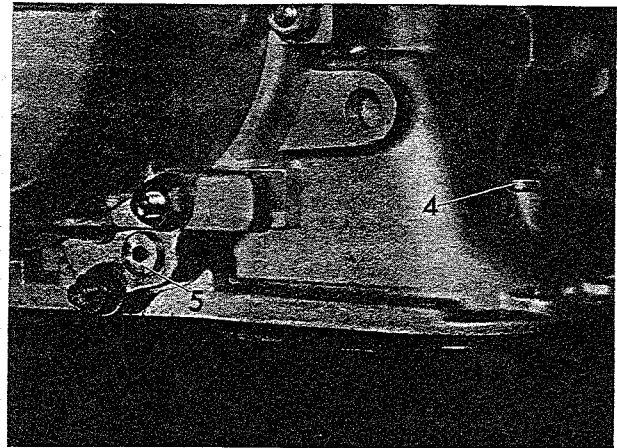
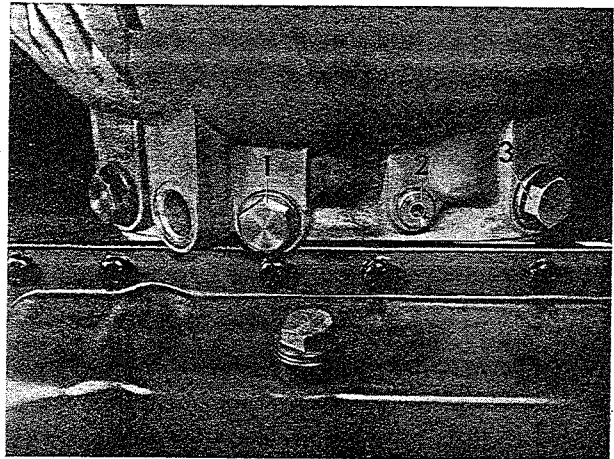
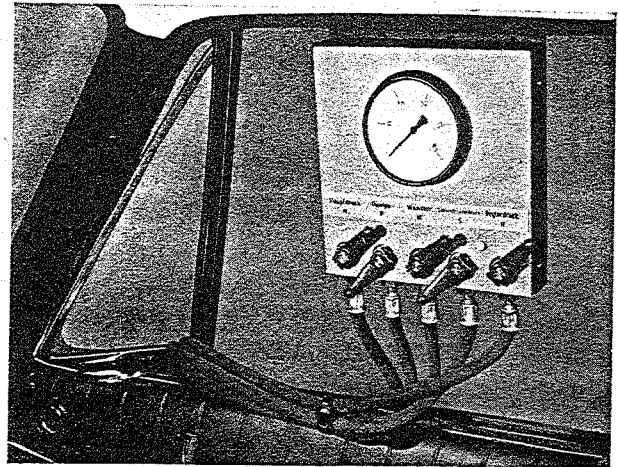
Accelerator linkage in kickdown position (hand-held) = 7.0–7.3 atü (99.56–103.83 psi).

Main pressure setting (3) position 0, accelerator linkage disconnected, engine speed 1000 rpm = 5.0 atü (71.12 psi). Accelerator linkage in kickdown position (hand-held) = 7.0 atü (99.56 psi).

Gear change throttle valve pressure (4) position 0, accelerator linkage disconnected, engine speed 1000 rpm = 0.9–1.2 atü (12.80–17.07 psi).

Accelerator linkage in kickdown position (hand-held) = 3.5–3.7 atü. (49.78–52.63 psi).

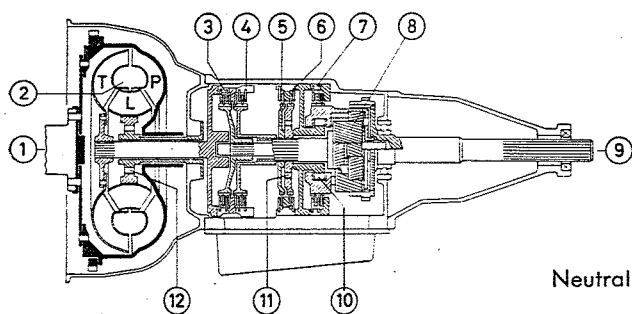
Governor pressure (5) position A, vehicle speed 50 kph (31.1 mph) = 1.3–1.5 atü (4.27–7.11 psi).



Tightening torque values for bolts and nuts

| | |
|--------------------------------------------------------------|---------------------------------|
| Studs in gearbox casing | 0.5–0.6 mkp (3.6–4.3 ft/lb) |
| Parking lock mounting | 1.0 mkp (7.2 ft/lb) |
| Driving shaft | 1.0 mkp (7.2 ft/lb) |
| Oil pump | 1.0 mkp (7.2 ft/lb) |
| Oil sump | 1.0 mkp (7.2 ft/lb) |
| Speedometer drive bush | 1.0 mkp (7.2 ft/lb) |
| Selector unit | 0.6 mkp (4.3 ft/lb) |
| Torque converter driving plate | 2.0+0.4 mkp (14.5+2.9 ft/lb) |
| Converter dome closure bolts, gearbox extension AM 10 × 1 | 1.5 mkp (10.8 ft/lb) |

| | |
|----------------------------------------------|-------------------------------------|
| Converter dome closure bolts, AM 18 × 1.5 | 3.5 mkp (25.3 ft/lb) |
| Starter lock and reverse switch | 3.5 mkp (25.3 ft/lb) |
| Bearing flange and gearbox extension | 2.3 mkp (16.6 ft/lb) |
| Converter dome to gearbox | 2.3 mkp (16.6 ft/lb) |
| Collar nuts, output side | 12.0–15.0 mkp (86.8–108.5 ft/lb) |
| Cooler valve on converter dome | 3.3 mkp (23.9 ft/lb) |
| Hollow screw – return line | 3.3 mkp (23.9 ft/lb) |



Power Flow 3 HP-12/B

- | | |
|---------------------|------------------------|
| 1 Engine crankshaft | 6 Disc brake C |
| 2 Torque converter | 7 Disc brake D |
| P Impeller | 8 Planetary gear train |
| L Stator | 9 Input shaft |
| T Turbine | 10 Free wheel |
| 3 Clutch A | 11 Free wheel |
| 4 Clutch B | 12 Free wheel |
| 5 Disc brake C' | |

