

# Workshop Handbook

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# 66C, 66D turbo

## HYDRAULIC SYSTEM

**KOMATSU**



# **Workshop Handbook**

**Hydraulic System      66 C**

3072 517 M1

**HANOMAG**



## PREFACE and EXPLANATIONS

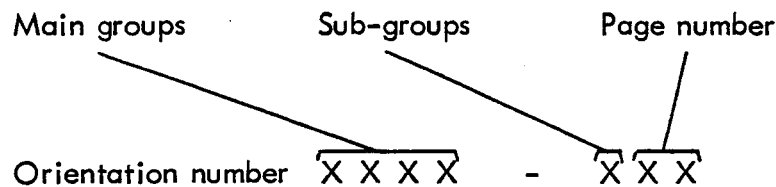
This manual should assist the skilled construction machine mechanic when carrying out repairs and adjustments on MF construction machines. The procedures are written in such a style that the dismantling and assembling of the components can be carried out successfully and without difficulty.

To assist in the locating of specific test-repair operations, working description etc. this manual is divided into main and sub-groups. This also applies to all types of service manuals.

At the top right hand corner of every page next to the section heading a series of numbers (orientation number) are to be found. These numbers follow in numerical sequence throughout the book.

The section heading applies either to the construction machine type, assembly or component for which the text and illustrations are valid.

Orientation number:



The main group numbers refer to either main assemblies, groups of main assemblies, sub-assemblies or components.

Example:                      Group 1700 - Steering (mechanical steering, assisted steering, hydro-steering, steering unit)

The sub-group numbers classify the descriptions and details as follows:

- 0 - General
- 1 - Functional description
- 2 - Fault diagnosis and possible remedies
- 3 - Tests and adjustments
- 4 - Strip and rebuild
- 5 - Technical data



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# **66 C *turbo*    66 D *turbo***

Group 2200

HYDRAULIC SYSTEM

Group 1700

STEERING SYSTEM

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## LOADER and STEERING HYDRAULICS

### Loader hydraulics

A two-stage system where the outputs of the loader pump and switch pump are controlled dependent on system load.

The system is remote controlled via a servo control system.

### Steering hydraulics

Articulated steering system with ZF hydro-steering column assembly and two steering cylinders.

Constant oil supply by the steering and switch pumps over the complete engine speed range. With the engine stopped, oil supply to steering system maintained by the ZF emergency steering pump.

### Summary of pump outputs and system pressures (see Fig. M 304)

1 Switch pump : HAMWORTHY

Output 155 ltr/min at 2200 rpm

2 Steering pump : HAMWORTHY

Output 91.5 ltr/min at 2200 rpm

3 Loader pump : HAMWORTHY

Output 290 ltr/min at 2200 rpm

4 Servo pump: HAMWORTHY

Output 53.5 ltr/min at 2200 rpm

5 Emergency steering pump: ZF

Output dependent on travel speed of machine, however, at a speed approaching 20 km/h = 50 ltr constant

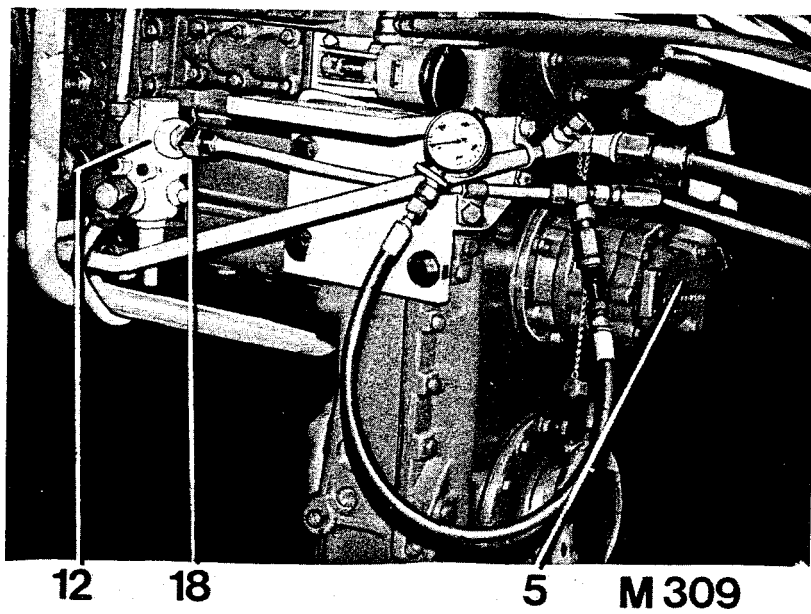
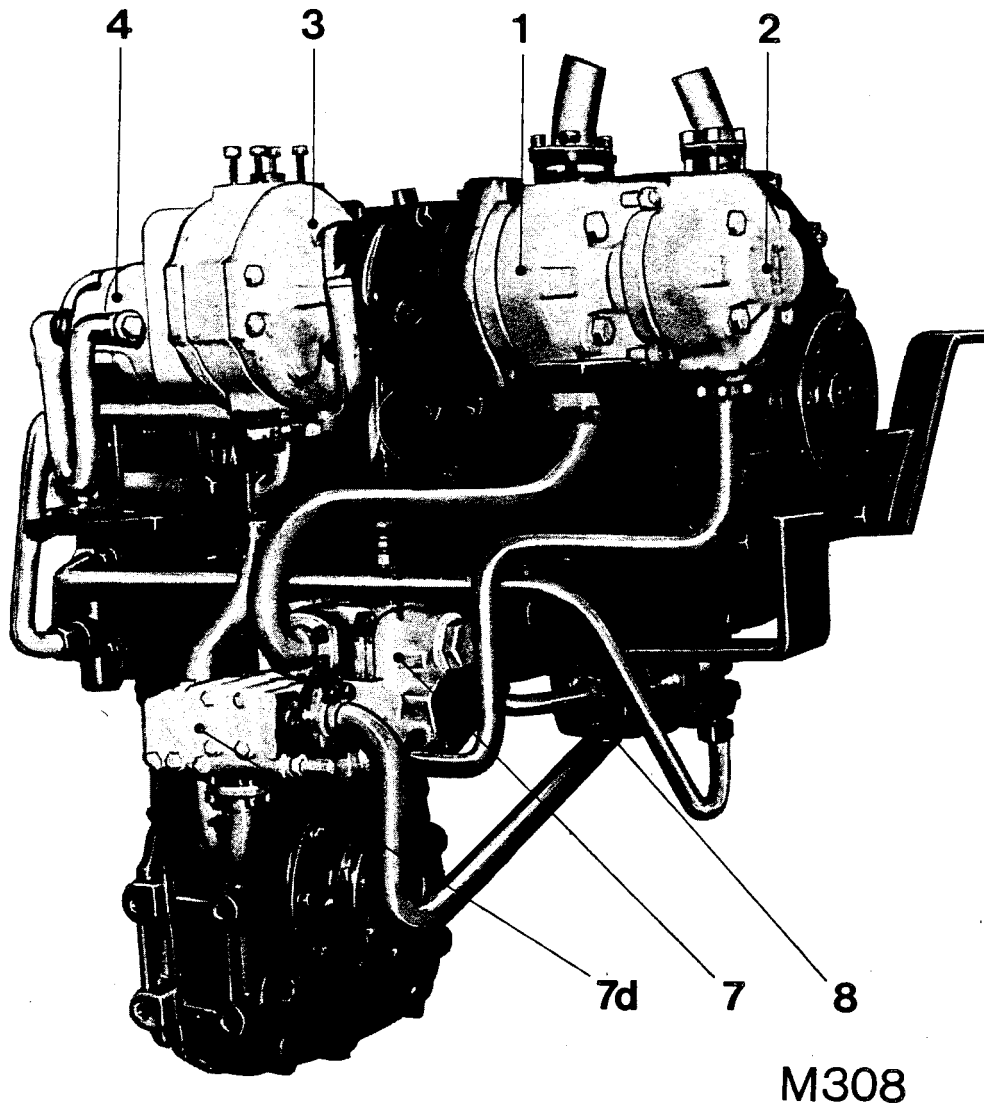
6b	Oil filter by-pass valve	1.5 bar
7d	Unloading (regulating) valve	140 bar
8a	Steering pressure relief valve	180 bar
8f	Emergency steering circuit relief valve	100 bar
10a	Oil cooler by-pass valve	3.5 bar
12	Servo control pressure holding valve	26 <sup>+0.5</sup> bar (24 bar min. engine idling)
14a	Loader hydraulics pressure relief valve	180 <sup>+5</sup> bar
14f	Service line relief valves (shock valves) bucket dump, crowd and loader lift circuits	320 bar
14h	Pressure reducing valve for reducing static pressure	15 <sup>+1</sup> bar
14i	Emergency lowering pressure relief valve	35 <sup>+2</sup> bar

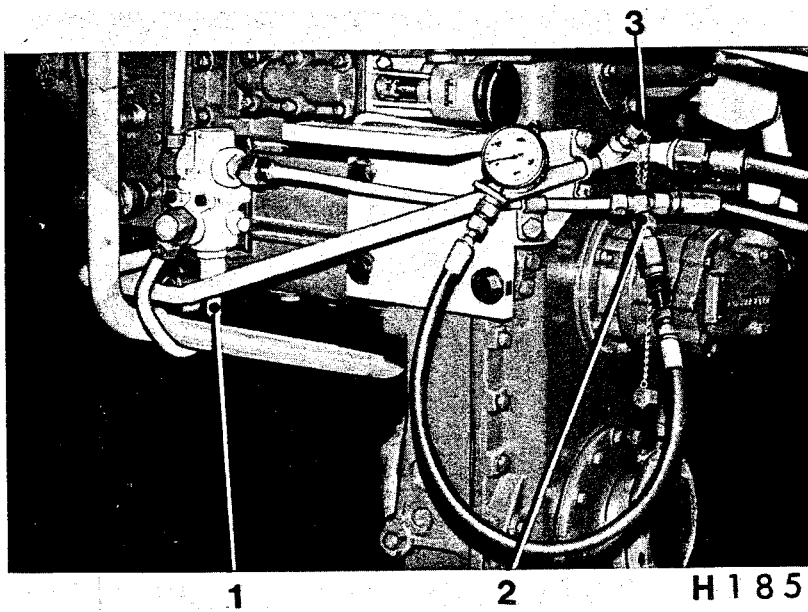
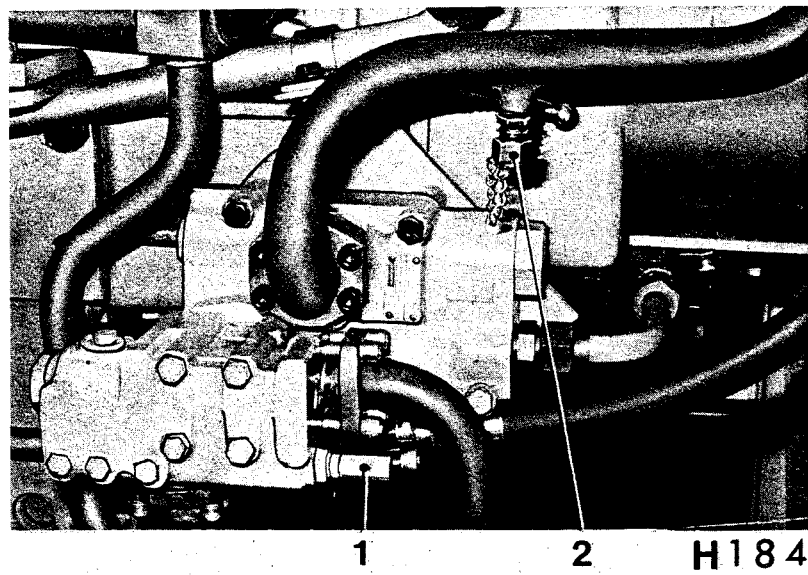
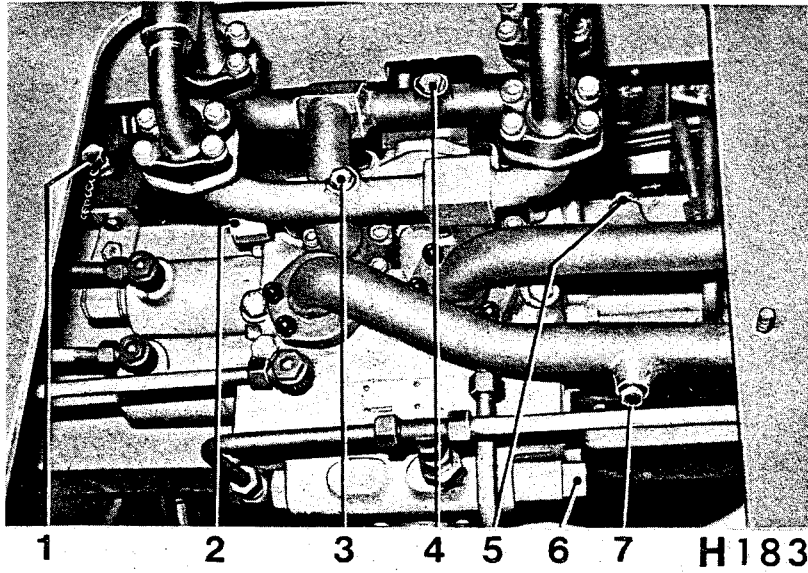
## LOADER and STEERING HYDRAULICS

### Arrangement of the hydraulic components mounted on the transmission assembly

Fig. M 308	1	Switch pump
	2	Steering pump
	3	Loader pump
	4	Servo pump
	7	Demand / regulating valve
	7d	Unloading (regulating) valve
	8	Steering valve block

Fig. M 309	5	Emergency steering pump
	12	Servo circuit pressure holding valve
	18	Check valve







## LOADER and STEERING HYDRAULICS

### Pressure test points

Fig. H 183

- 1 Maximum pressure loader hydraulics
- 2 Loader hydraulics pressure relief valve
- 3 Bucket dump pressure
- 4 Bucket crowd pressure
- 5 Loader lift pressure
- 6 Emergency lowering pressure reducing valve and pressure relief valve
- 7 Loader lower pressure

Fig. H 184

- 1 Unloading (regulating) valve in demand/regulating valve assembly
- 2 Switch pump unloading pressure

Fig. H 185

- 1 Servo control holding valve
- 2 Servo control pressure
- 3 Steering circuit pressure

## LOADER and STEERING HYDRAULICS

Fig. M 304 Hydr. and elect. circuit diagram (3-spool control valve and return to dig system)

- |     |   |   |
|-----|---|---|
| 1   | Switch pump: Hamworthy  | Output = 155 ltr/min at 2200 rpm        |
| 2   | Steering pump: Hamworthy  | Output = 91.5 ltr/min at 2200 rpm       |
| 3   | Loader pump: Hamworthy  | Output = 290 ltr/min at 2200 rpm        |
| 4   | Servo pump: Hamworthy   | Output = 53.5 ltr/min at 2200 rpm       |
| 5   | Emergency steering pump: ZF   | Output = 50 ltr/min constant at 20 km/h |
| 6   | Oil tank  |   |
| 6a  | Oil filter, each filter 2 elements  |   |
| 6b  | By pass valve for oil filter, 1.5 bar   |   |
| 7   | Demand/regulating valve   |   |
| 7a  | Demand spool valve  |   |
| 7b  | Steering oil volume restrictor = 10.9 mm dia.   |   |
| 7c  | Check valve   |   |
| 7d  | Unloading (regulating) valve = 140 bar  |   |
| 8   | Steering valve block  |   |
| 8a  | Pressure relief valve = 180 bar   |   |
| 8b  | Sequence valve  |   |
| 8c  | Check valve   |   |
| 8d  | Shock valve = 400 bar   |   |
| 8e  | Flow indicator  |   |
| 8f  | Emergency steering circuit pressure relief valve = 100 bar  |   |
| 9   | Hydro-steering column valve   |   |
| 10  | Oil cooler  |   |
| 10a | Oil cooler by-pass valve = 3.5 bar  |   |
| 11  | Steering cylinders  |   |
| 12  | Servo circuit pressure holding valve = $26^{+0.5}$ bar  |   |
| 13  | Servo control valve   |   |
| 13b | Spool valve for actuating 14 b  |   |
| 13c | Spool valve for actuating 14 c  |   |
| 13d | Spool valve for actuating 14 d and 14 e   |   |
| 14  | Main control valve  |   |
| 14a | Pressure relief valve = $180^{+5}$ bar  |   |
| 14b | Spool valve - supplementary equipment   |   |
| 14c | Bucket spool valve (crowd and dump)   |   |
| 14d | Loader spool valve (lift and lower)   |   |
| 14e | Float spool valve   |   |
| 14f | Service line relief (shock) valves = 320 bar (bucket dump, crowd and loader lift)                             |   |
| 14g | Anti cavitation valves (bucket crowd, dump and loader lift)   |   |
| 14h | Pressure reducing valve - $15^{+1}$ bar for reducing the static oil pressure for emergency lowering operation |   |
| 14i | Emergency lowering pressure relief valve = $35^{+2}$ bar  |   |
| 15  | Lift cylinders: S=lower H= lift   |   |
| 16  | Bucket cylinders: A = dump E = crowd  |   |
| 17  | Supplementary equipment connection point  |   |
| 18  | Check valve - closed under emergency lowering conditions  |   |
| 19  | Check valve - closed under normal operating conditions  |   |

