

SERVICE MANUAL

**EXCAVATOR
R110-7**

HYUNDAI

[*http://marengine.com/r110-7-excavator*](http://marengine.com/r110-7-excavator)

SECTION 1 GENERAL

Group 1 Safety Hints	1-1
Group 2 Specifications	1-9

SECTION 2 STRUCTURE AND FUNCTION

Group 1 Pump Device	2-1
Group 2 Main Control Valve	2-19
Group 3 Swing Device	2-42
Group 4 Travel Device	2-54
Group 5 RCV Lever	2-68
Group 6 RCV Pedal	2-75

SECTION 3 HYDRAULIC SYSTEM

Group 1 Hydraulic Circuit	3-1
Group 2 Main Circuit	3-2
Group 3 Pilot Circuit	3-5
Group 4 Single Operation	3-12
Group 5 Combined Operation	3-24

SECTION 4 ELECTRICAL SYSTEM

Group 1 Component Location	4-1
Group 2 Electrical Circuit	4-3
Group 3 Electrical Component Specification	4-23
Group 4 Connectors	4-35

SECTION 5 MECHATRONICS SYSTEM

Group 1 Outline	5-1
Group 2 Mode Selection System	5-3
Group 3 Power Boost System	5-4
Group 4 Travel Speed Control System	5-5
Group 5 Automatic Warming Up Function	5-6
Group 6 Engine Overheat Prevention Function	5-7
Group 7 Anti-Restart System	5-8
Group 8 Self-Diagnostic System	5-9

Group 9 Engine Control System	5-11
Group 10 EPPR(Electro Proportional Pressure Reducing) Valve	5-17
Group 11 Prolix Switch	5-20
Group 12 Monitoring System	5-21

SECTION 6 TROUBLESHOOTING

Group 1 Before Trobleshooting	6-1
Group 2 Hydraulic and Mechanical System	6-4
Group 3 Electrical System	6-24
Group 4 Mechatronics System	6-41

SECTION 7 MAINTENANCE STANDARD

Group 1 Operational Performance Test	7-1
Group 2 Major Components	7-21
Group 3 Track and Work Equipment	7-29

SECTION 8 DISASSEMBLY AND ASSEMBLY

Group 1 Precaution	8-1
Group 2 Tightening Torque	8-4
Group 3 Pump Device	8-7
Group 4 Main Control Valve	8-29
Group 5 Swing Device	8-43
Group 6 Travel Device	8-65
Group 7 RCV Lever	8-103
Group 8 Turning Joint	8-118
Group 9 Boom, Arm and Bucket Cylinder	8-123
Group 10 Undercarriage	8-140
Group 11 Work Equipment	8-152

SECTION 9 COMPONENT MOUNTING TORQUE

Group 1 Introduction Guide	9-1
Group 2 Engine System	9-2
Group 3 Electric System	9-4
Group 4 Hydraulic System	9-6
Group 5 Undercarriage	9-10
Group 6 Structure	9-11
Group 7 Work Equipment	9-14

1. STRUCTURE

This service manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.

This service manual mainly contains the necessary technical information for operations performed in a service workshop.

For ease of understanding, the manual is divided into the following sections.

SECTION 1 GENERAL

This section explains the safety hints and gives the specification of the machine and major components.

SECTION 2 STRUCTURE AND FUNCTION

This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.

SECTION 3 HYDRAULIC SYSTEM

This section explains the hydraulic circuit, single and combined operation.

SECTION 4 ELECTRICAL SYSTEM

This section explains the electrical circuit, monitoring system and each component. It serves not only to give an understanding electrical system, but also serves as reference material for trouble shooting.

SECTION 5 MECHATRONICS SYSTEM

This section explains the computer aided power optimization system and each component.

SECTION 6 TROUBLESHOOTING

This section explains the troubleshooting charts correlating **problems** to **causes**.

SECTION 7 MAINTENANCE STANDARD

This section gives the judgement standards when inspecting disassembled parts.

SECTION 8 DISASSEMBLY AND ASSEMBLY

This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

SECTION 9 COMPONENT MOUNTING TORQUE

This section shows bolt specifications and standard torque values needed when mounting components to the machine.

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Contact your HYUNDAI distributor for the latest information.

2. HOW TO READ THE SERVICE MANUAL

Distribution and updating

Any additions, amendments or other changes will be sent to HYUNDAI distributors.

Get the most up-to-date information before you start any work.

Filing method

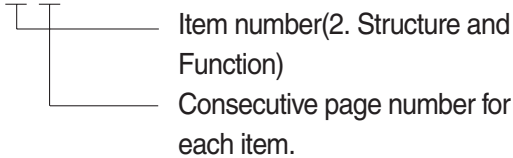
1. See the page number on the bottom of the page.

File the pages in correct order.

2. Following examples shows how to read the page number.

Example 1

2 - 3



3. Additional pages : Additional pages are indicated by a hyphen(-) and number after the page number. File as in the example.

10 - 4

10 - 4 - 1

10 - 4 - 2

10 - 5

Added pages

Revised edition mark(①②③...)

When a manual is revised, an edition mark is recorded on the bottom outside corner of the pages.

Revisions

Revised pages are shown at the **list of revised pages** on the between the contents page and section 1 page.

Symbols

So that the shop manual can be of ample practical use, important places for safety and quality are marked with the following symbols.

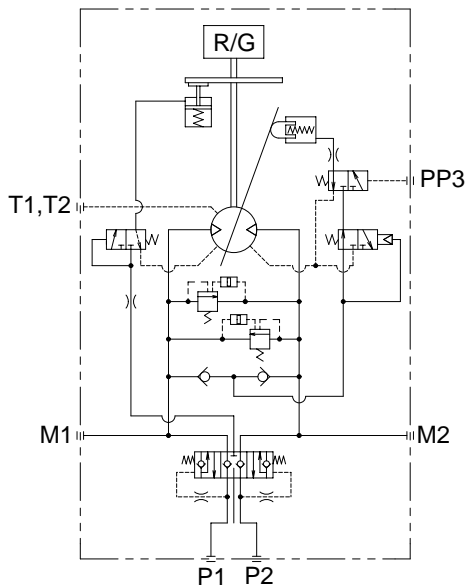
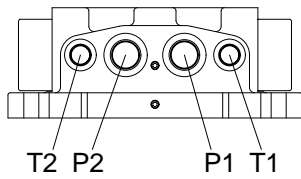
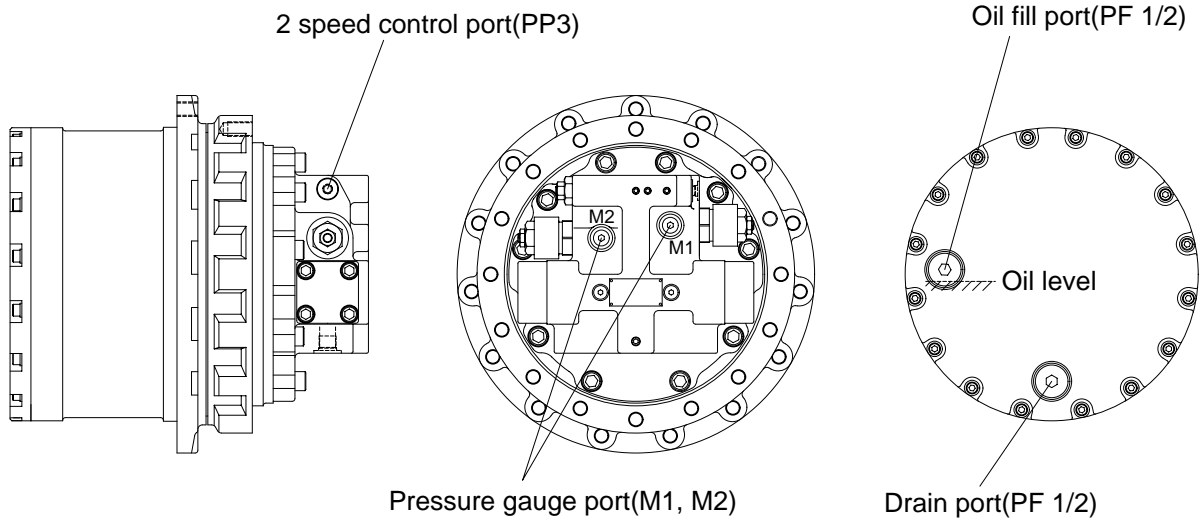
Symbol	Item	Remarks
	Safety	Special safety precautions are necessary when performing the work.
		Extra special safety precautions are necessary when performing the work because it is under internal pressure.
	Caution	Special technical precautions or other precautions for preserving standards are necessary when performing the work.

GROUP 4 TRAVEL DEVICE

1. CONSTRUCTION

Travel device consists travel motor and gear box.

Travel motor includes brake valve, parking brake and high/low speed changeover mechanism.



Port	Port name	Port size
P1	Main port	SAE 5000psi 1"
P2	Main port	SAE 5000psi 1"
M1, M2	Gauge port	PT 1/4
T1, T2	Drain port	PF 1/2
PP3	2 speed control port	PF 1/4

11072TM01

GROUP 8 TURNING JOINT

1. REMOVAL AND INSTALL

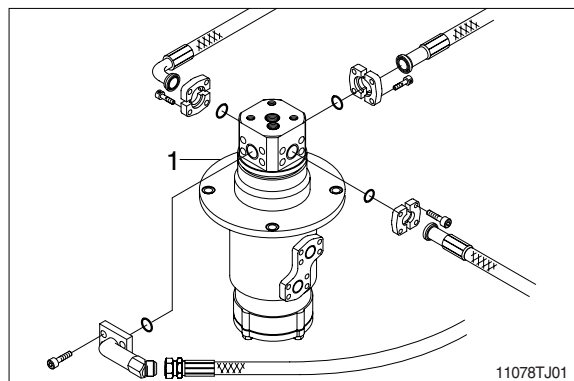
1) REMOVAL

- (1) Lower the work equipment to the ground and stop the engine.
- (2) Operate the control levers and pedals several times to release the remaining pressure in the hydraulic piping.
- (3) Loosen the breather slowly to release the pressure inside the hydraulic tank.

▲ Escaping fluid under pressure can penetrate the skin causing serious injury.

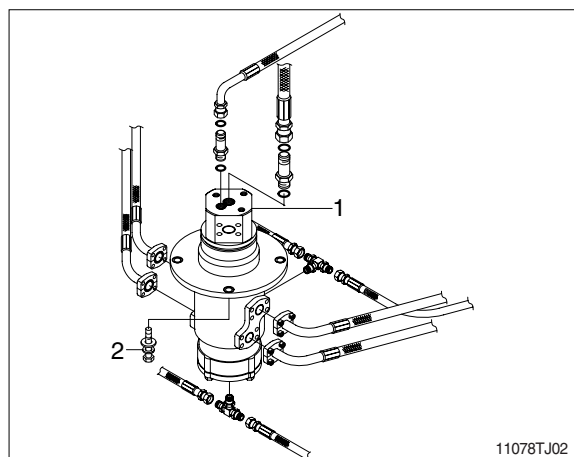
※ When pipes and hoses are disconnected, the oil inside the piping will flow out, so catch it in oil pan.

- (4) Disconnect all hoses.
 - (5) Sling the turning joint assembly (1) and remove the mounting bolt(2).
 - Weight : 54kg(119lb)
 - Tightening torque : $12.3 \pm 1.3 \text{kgf} \cdot \text{m}$
($88.2 \pm 9.4 \text{lb} \cdot \text{ft}$)
 - (6) Remove the turning joint assembly.
- ※ When removing the turning joint, check that all the hoses have been disconnected.



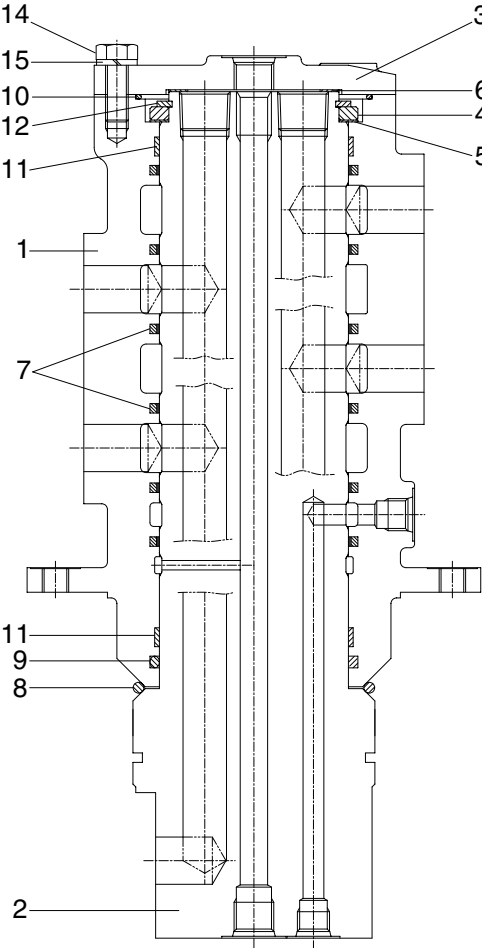
2) INSTALL

- (1) Carry out installation in the reverse order to removal.
 - ※ Take care of turning joint direction.
 - ※ Assemble hoses to their original positions.
 - ※ Confirm the hydraulic oil level and check the hydraulic oil leak or not.



2. DISASSEMBLY AND ASSEMBLY

1) STRUCTURE



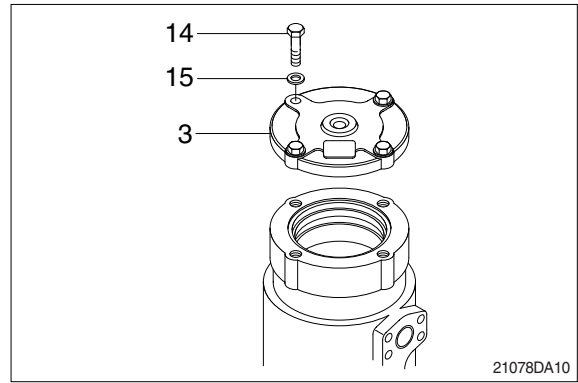
21078DA09

- | | | | | | |
|---|--------|----|--------------|----|---------------|
| 1 | Hub | 6 | Shim | 11 | Wear ring |
| 2 | Shaft | 7 | Slipper seal | 12 | Retainer ring |
| 3 | Cover | 8 | O-ring | 13 | Plug |
| 4 | Spacer | 9 | O-ring | 14 | Hexagon bolt |
| 5 | Shim | 10 | O-ring | 15 | Spring washer |

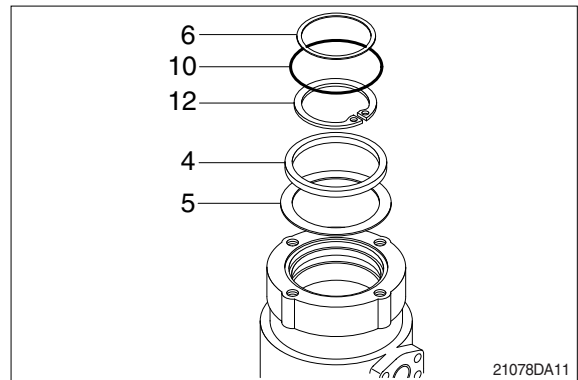
2) DISASSEMBLY

※ Before the disassembly, clean the turning joint.

- (1) Remove bolts(14), washer(15) and cover(3).

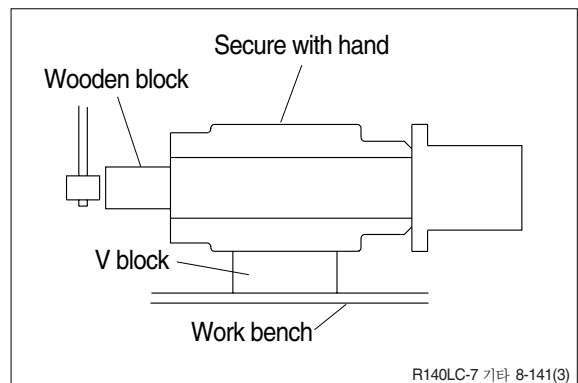


- (2) Remove shim(6) and O-ring(10).
- (3) Remove retainer ring(12), spacer(4) and shim(5).

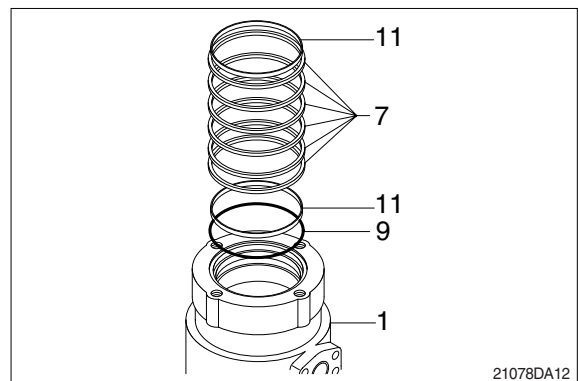


- (4) Place hub(1) on a V-block and by using a wood buffer at the shaft end, hit out shaft(2) to about 1/2 from the body with a hammer.

※ Take care not to damage the shaft(2) when remove hub(1) or rest it sideways.
※ Put a fitting mark on hub(1) and shaft(2).



- (5) Remove six slipper seals(7) and O-ring(9), two ring wear(11) from hub(1).



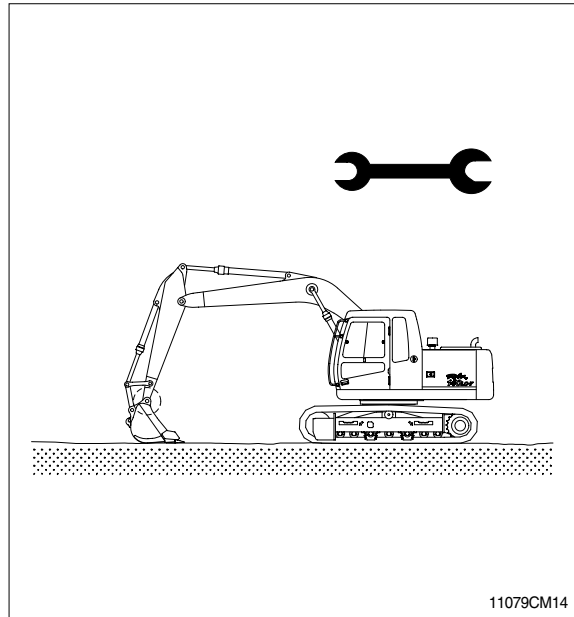
SECTION 9 COMPONENT MOUNTING TORQUE

Group 1	Introduction guide	9-1
Group 2	Engine system	9-2
Group 3	Electric system	9-4
Group 4	Hydraulic system	9-6
Group 5	Undercarriage	9-10
Group 6	Structure	9-11
Group 7	Work equipment	9-14

SECTION 9 COMPONENT MOUNTING TORQUE

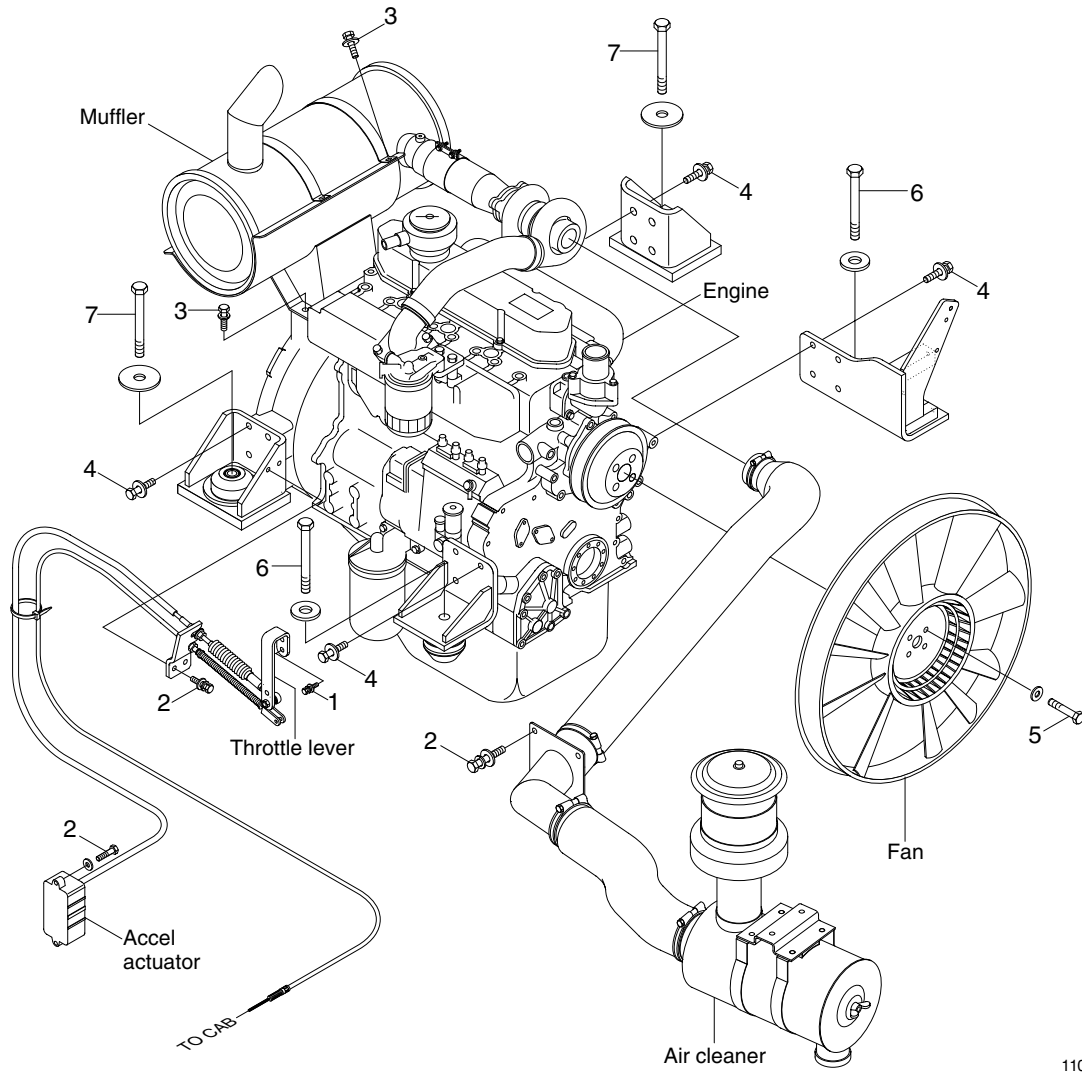
GROUP 1 INTRODUCTION GUIDE

1. This section shows bolt specifications and standard torque values needed when mounting components to the machine.
 2. Use genuine Hyundai spare parts.
We expressly point out that Hyundai will not accept any responsibility for defects resulted from non-genuine parts.
In such cases Hyundai cannot assume liability for any damage.
- ※ **Only metric fasteners can be used and incorrect fasteners may result in machine damage or malfunction.**
 - ※ **Before installation, clean all the components with a non-corrosive cleaner. Bolts and threads must not be worn or damaged.**



GROUP 2 ENGINE SYSTEM

1. ENGINE AND ACCESSORIES MOUNTING



11079CM01

· Tightening torque

Item	Size	kgf · m	lbf · ft
1	M 6×1.0	1.1±0.2	7.95±1.45
2	M 8×1.25	2.5±0.5	18.1±3.6
3	M10×1.5	6.9±1.4	49.9±10.1
4	M12×1.75	10±2.0	72.3±14.5

Item	Size	kgf · m	lbf · ft
5	M10×1.5	4.4	31.8
6	M16×2.0	55±3.5	398±25.3
7	M20×2.5	30±3.5	217±25.3
-	-	-	-

Diesel Engines

ABS	Agco-Sisu
Akasaka	Baudouin
BMW	Bukh
Caterpillar	CHN 25/34
Cummins	Daihatsu
Detroit	Deutz
Doosan-Daewoo	Fiat
Ford	GE
Grenaa	Guascor
Hanshin	Hatz
Hino	Honda
Hyundai	Isotta
Isuzu	Iveco
John-Deere	Kelvin
Kioti	Komatsu
Kubota	Liebherr
Lister	Lombardini
MAK	MAN B&W
Mercedes	Mercruiser
Mirrlees BS	Mitsubishi
MTU	MWM
Niigata	Paxman
Perkins	Pielstick
Rolls / Bergen	Ruggerini
Ruston	Scania
Shibaura	Sisu-Valmet
SKL	Smit-Bolnes
Sole	Stork
VM-Motori	Volvo
Volvo Penta	Westerbeke
Wichmann	Yanmar

Machinery

ABG	Airman
Akerman	Ammann
Astra	Atlas Copco
Atlas Weyha.	Atlet
Bell	Bendi
Bigjoe	Bobcat
Bomag	BT
Carelift	Case
Caterpillar	Cesab
Challenger	Champion
Claas	Clark
Combilift	Crown
Daewoo-Doosan	Demag
Deutz-Fahr	Dressta

Machinery

Drott	Dynapack
Extec	Faun
Fendt	Fiat
Fiatallis	Flexicoil
Furukawa	Gehl
Genie	Grove-gmk
Halla	Hamm
Hangcha	Hanix
Hanomag	Hartl
Haulpack	Hiab
Hidromek	Hino truck
Hitachi	Hyster
Hyundai	IHI
Ingersoll-rand	JCB
JLG	John-Deere
Jungheinrich	Kalmar
Kato	Kioti
Kleeman	Kobelco
Komatsu	Kramer
Kubota	Lamborghini
Landini	Liebherr
Linde	Link-belt
Manitou	Massey-Ferg.
Mccormick	MDI-Yutani
Mitsubishi	Moxy
Mustang	Neusson
New-Holland	Nichiyu
Nissan	OK
OM-Pimespo	others-tech
Pel-Job	PH-mining
Poclain	Powerscreen
Same	Samsung
Sandvik	Scania
Schaefer	Schramm
Sennebogen	Shangli
Shibaura	Steiger
Steinbock	Steyr
Still	Sumitomo
Super-pac	Tadano
Takeuchi	TCM
Terex	Toyota
Valpadana	Venieri
Versatile	Vogele
Volvo	Weidemann
Wirtgen	Yale
YAM	Yanmar