

New Hyundai A-series Wheel Loader

Product Sales Training

February 2020

CE Product Management Europe

A BUCKET FULL OF ADDED VALUE



A-Series Wheel Loaders

2/28/2020

Hyundai Construction Equipment

TRAINING CONTENTS

1. Overview
2. Efficiency
3. Design & Safety
4. Comfort
5. Integrated Technologies
6. Services
7. Durability improvements

Added value to your equipment



HL900A –Series Overview

23rd SAMOTER INNOVATION AWARD

HL960A WINNER category WHEELED LOADERS | MEDIUM



- “for the evolution of a project paying maximum attention to management of operating costs, operating efficiency and design ensuring maximum visibility and operator safety”
- The new HL960A wheeled loader complies with European Stage V emission levels and
- ensures consumption efficiency, top performances even in situations of
- prolonged operation, higher productivity and optimised work time management,
- high safety standards, improved visibility and maximum operator comfort.

HL900 A-series: What's new?

OUTSTANDING FEATURES FOR THE NEW GENERATION



- ▶ New Engine Platform: Environmental Aspect & Fuel Efficiency
- ▶ Fuel Efficiency: Engine & Transmission Optimizations
- ▶ Cabin & Controls: Improved Safety & Convenience
- ▶ Safety & Visibility: Improved Design & Safety Features
- ▶ Uptime & Productivity: Axle, Linkage & MCV Improvements

Wheel Loader A-series

Line Up 13 – 31t / 2.3 – 5.6m³



**HL940A
HL940AXT
HL940ATM**



**HL955A
HL955AXT
HL955ATM**



**HL960A
HL960AXT**



**HL960AHD
HL960AHDXT**



**HL970A
HL970AXT**



**HL975
HL975XT**



**HL980A
HL980AXT**

**XT = highlift
TM = toolmaster
HD = heavy duty**

Overview

Wheel Loader Competition

Weight to	Hyundai	Volvo	Caterpillar	Komatsu	Liebherr	Hitachi	Doosan	JCB	Case
9,5		L50H	918M		L518 Stereo			417	
11-12		L60H		WA200-8	L526		DL200-5		521G
12-13	HL940A	L70H	926M	WA270-8	L538	ZW150-6	DL220-5		621G
13-14			930M		L546		DL250-5		
14-16	HL955A	L90H	938M	WA320-8		ZW180-6	DL280-5	427	721G
17-19	HL960A	L110H	950GC	WA380-8	L550 Xpower	ZW220-6	DL300-5	437	821G
19-21	HL965	L120H	950M		L556 Xpower	ZW250-6	DL350-5	547	921G
19-21			962M						
21-25	HL970A	L150H	966M	WA470-8	L566 Xpower	ZW310-6	DL420-5		
21-25			966M XE	WA475-10			DL420CVT-5		
25-28	HL975	L180H	972M	WA480-8	L576 Xpower	ZW330-6	DL450-5		1021G
25-28			972M XE						
28-32	HL980A	L220H	980M		L580 Xpower		DL550-5		1121G
32-36		L260H	982M	WA500-8	L586 Xpower	ZW370-6	DL580-5		

Key Sales Features

What's in it for the customer?

- Fuel efficiency – STAGE V
- Superior Powertrain
- Enhanced productivity
- Innovative safety features
- Class leading cab
- Larger, smarter monitor
- Easy Access to Service Points
- Long service intervals
- Low cost per hour



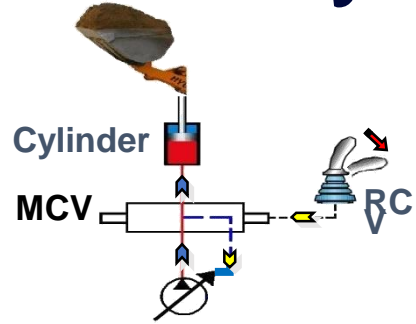
Overview of Components

A Choice of premium, long lasting Components

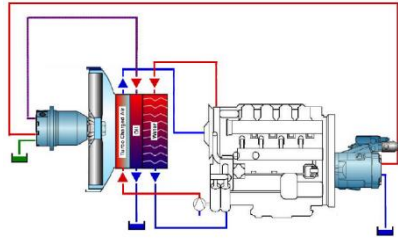


Efficiency

Efficiency Features

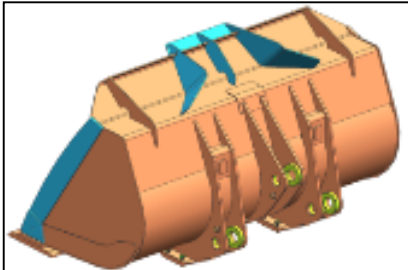


Variable Piston Pump



Variable Fan

Bucket with Improved fill factor less spillage



Eco-Pedal



Smart Eco-Guidance



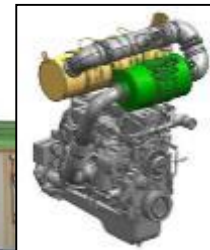
Auto Shut-Down



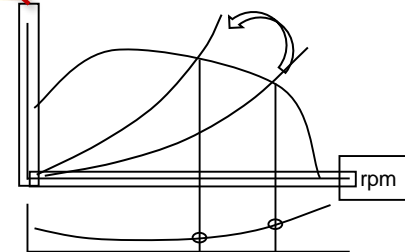
Weighing system



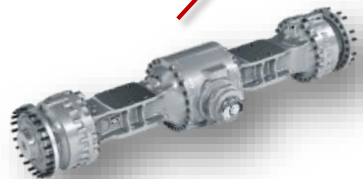
High performance & Excellent Fuel-Efficient Engine



Various Engine Modes & optimized power matching

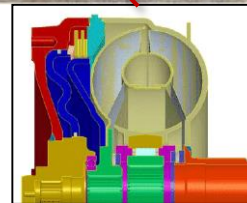


100% Auto diff lock



5 Speed TM

with Lock-up Clutch + ICCO



HL900A Specifications

Increased Max. Power

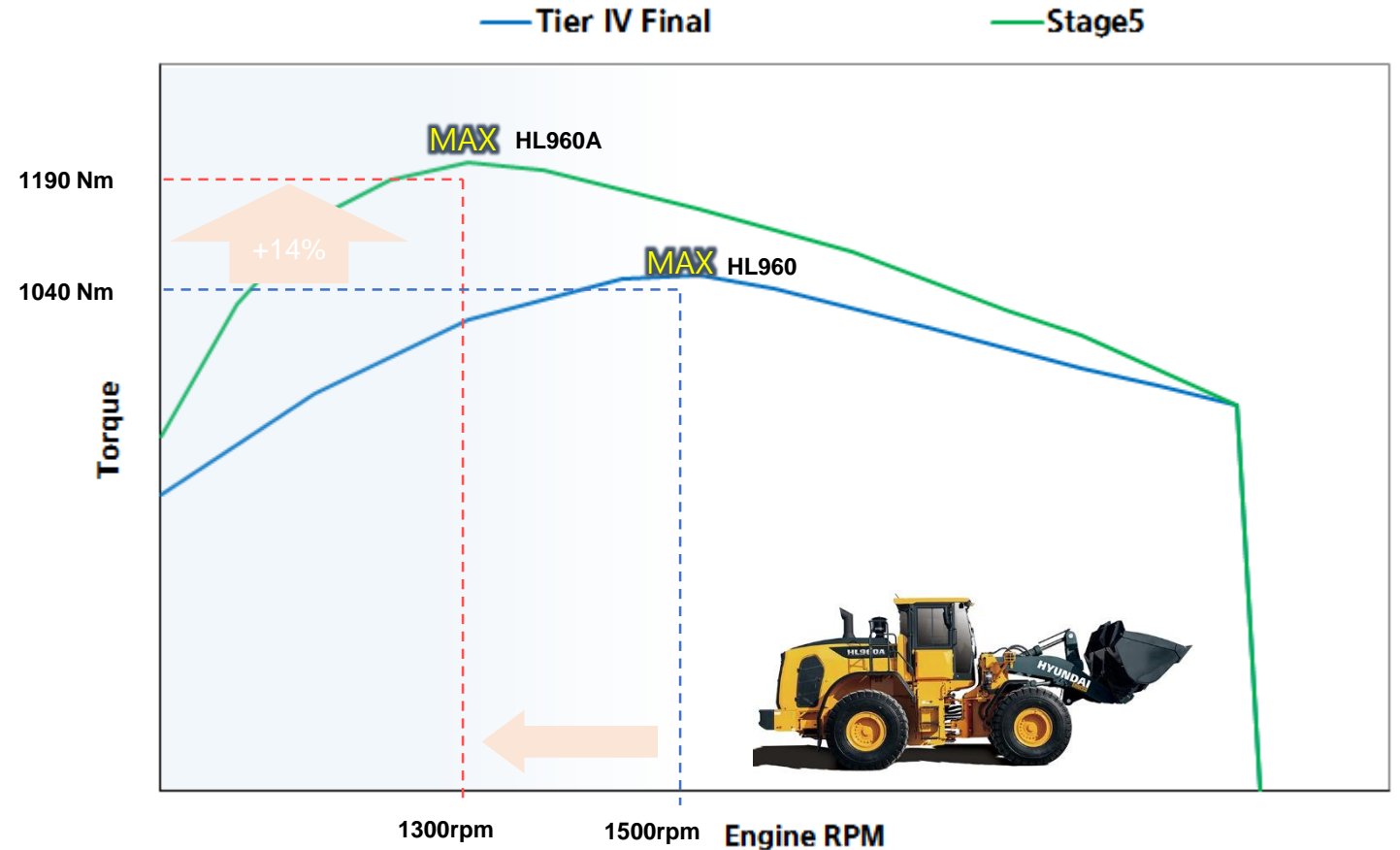
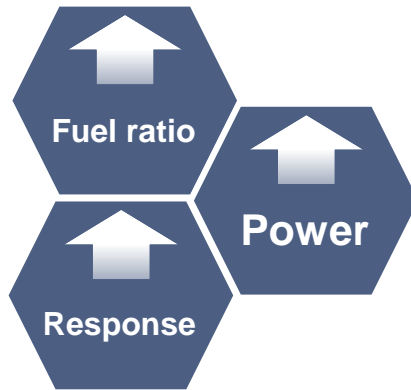
Model	Engine	Rated Power HP	Max Power HP	Max Torque Nm
HL930A	B4.5	133	---	633 @ 1.200
HL940A	B6.7	156	165 @ 1.800	746 @ 1.300
HL955A		200	210 @ 1.900	990 @ 1.300
HL960A		225	251 @ 1.900	1.186 @ 1.300
HL960A HD		225	251 @ 1.900	1.186 @ 1.300
HL965A		L9	270	---
HL970A	325		330 @ 2.000	1.636 @ 1.100
HL975	X12	335	381 @ 1.700	1.765 @ 1.400
HL975A CVT		335	381 @ 1.700	1.765 @ 1.400
HL980A		355	379 @ 1.700	1.857 @ 1.400

*Specifications are subject of being changed

Optimized Engine Performance

Increased engine torque at lower rpm

- Fuel efficiency
- Engine power
- Engine response time



Power Smart Mode

New Engine mode

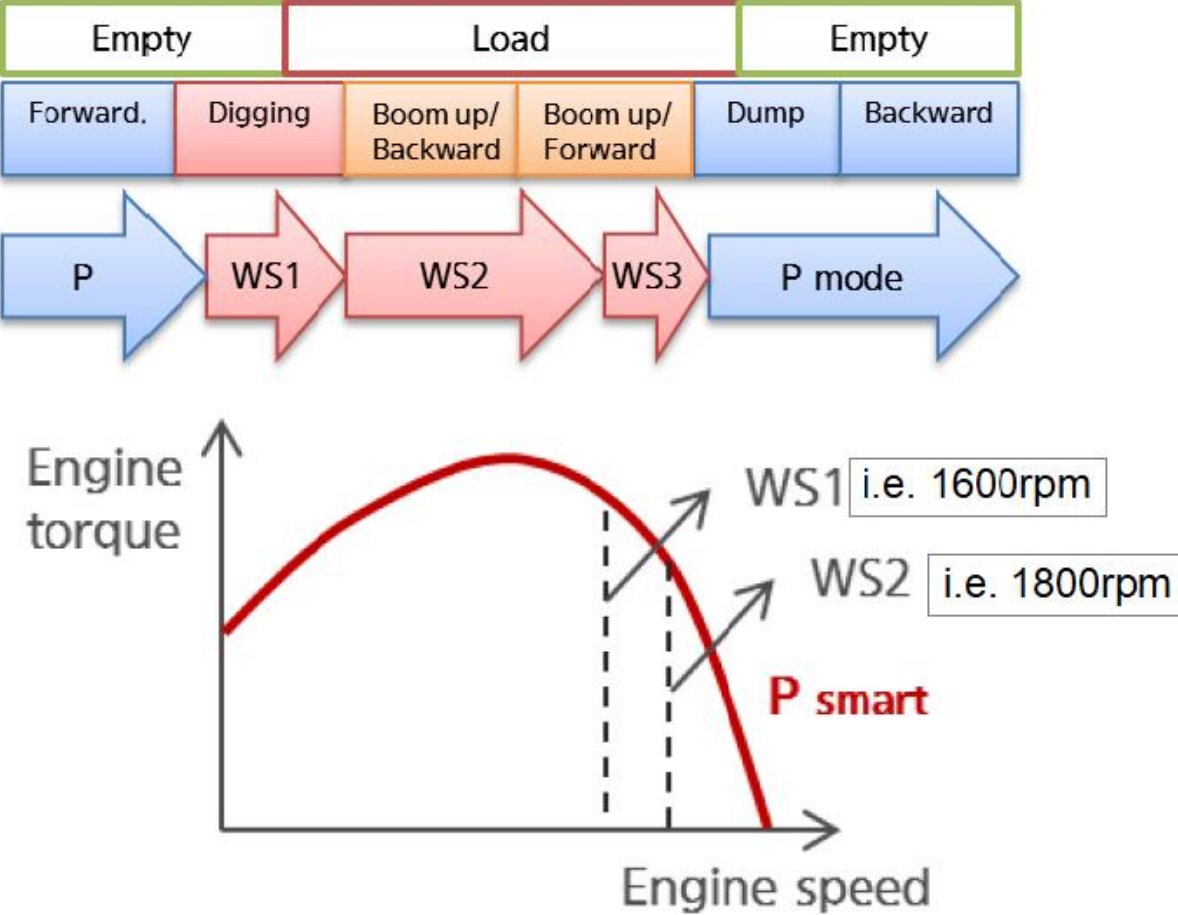
- Matching optimal power for work and driving at high work load
 - Function detects high work load
 - Consequently it adjusts the engine speed
 - Only with EH Control!
-
- Reduce energy losses
 - about 3~5% fuel savings

POWER **Smart**



Power Smart Mode

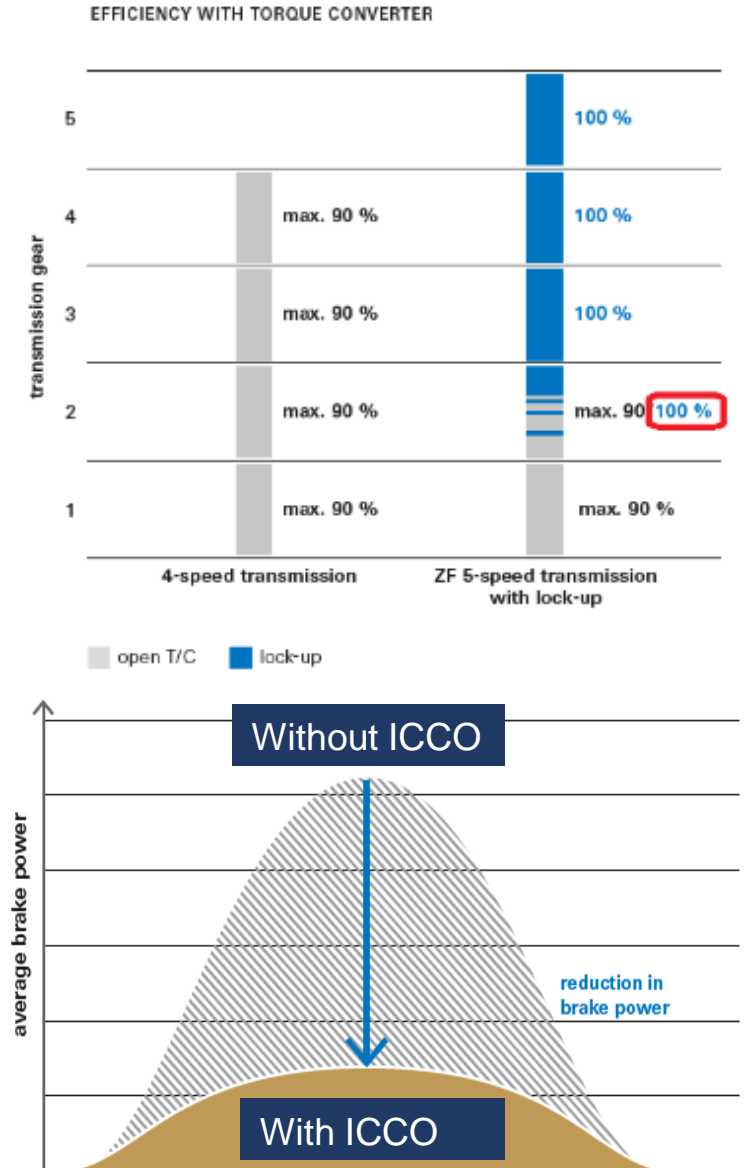
Limit Engine Speed at high working load



Optimized Transmission

Lock UP + ICCO

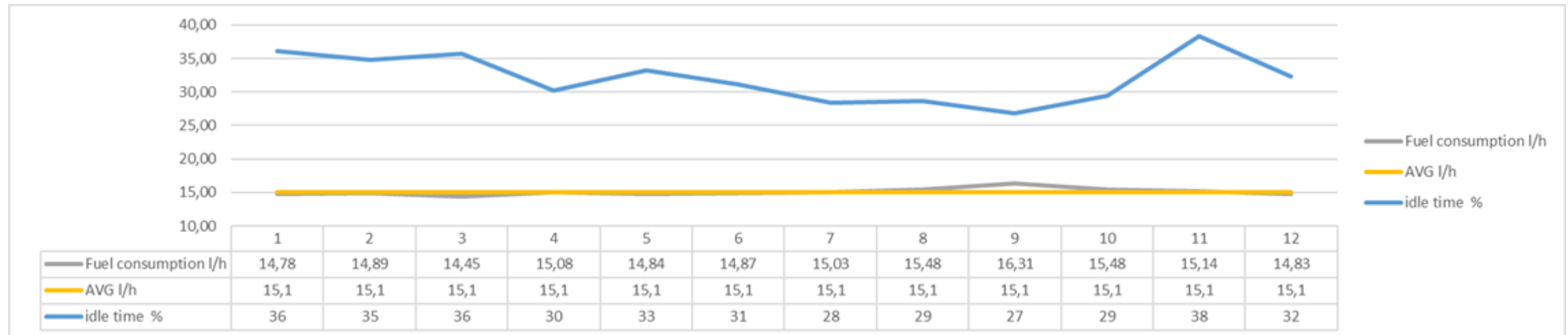
- Lock Up 2.- 5. gear (5- speed TM)
- ICCO (inching function)
- Improves Fuel efficiency
- Increases Productivity
- Increases available engine power for hydraulics during braking
- Increases brake life- time



HL975 Stage IV

Stage V Technology

- Himate data 2019 all HL975
- In reality the consumption will be slightly higher

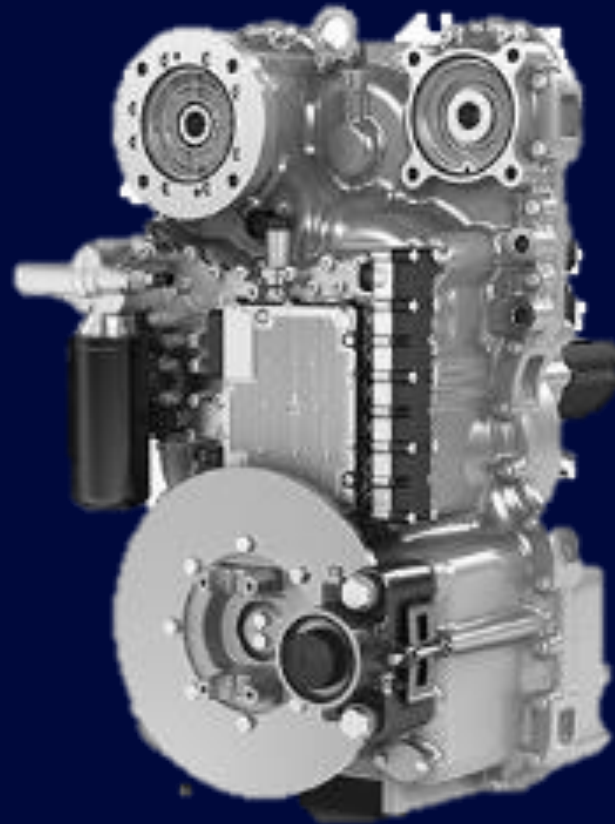


HL975 Stage IV

Stage V Technology


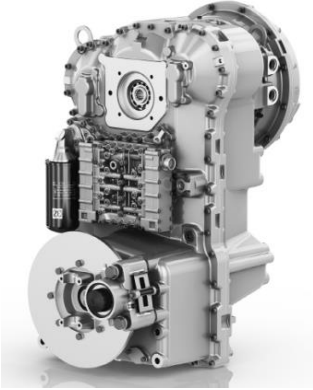
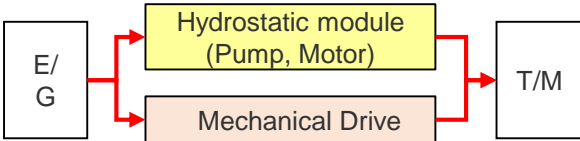

Date	Hourmeter	OP min	Working min	Travel min	Idle time min	Vehicle Mileage km	Weight to	Engine Power Mode			fuel consumption				Production		idle ratio	work ratio	travel ratio
								Economy	Standard	Power	l/day	l/h	l/to	to/l	to/h	m/h	%	%	%
2018-09-12	677	286	129	203	65	22,6	1222,0			4h 48m	76	15,91	0,059	17,93	271,45	1221,7	33,7	48,6	79,6
<ul style="list-style-type: none"> • Test in Rehandling application for ~170h • Customer has counted 14,5l/h • (Volvo L180H = 19,5l/h/ Komatsu WA480-7 =20l/h) 																			
Average		412,24	134	217	165	28,11	1124,544				95,6	13,91	0,085	11,76	163,67	4091,0	40,1	32,5	52,7

HL975ACVT



HL975A CVT

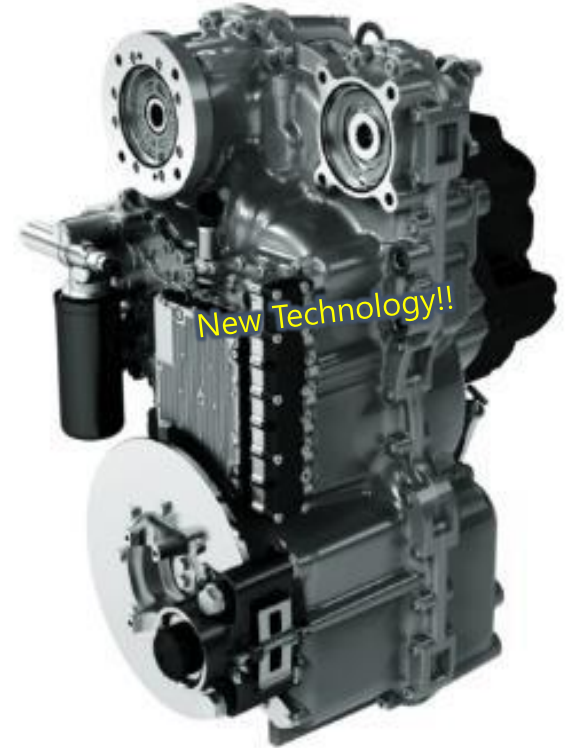
CVT vs HDT

Type	CVT (Continuously Variable T/M)	HDT (Hydro-dynamic T/M)
Design		
Concept		
Characteristic	<ul style="list-style-type: none"> ✓ Power Split Type CVT with Hydrostatic Module (Pump/Motor)+ Mechanical Drive - Low Speed / Heavy load: Hydrostat.+ Mech. Drive - High Speed / Light load: Mech. drive ✓ Improved driving comfort (no shocks in gear shifting) ✓ Acquired similar HDT dynamic characteristic 	<ul style="list-style-type: none"> ✓ Torque Converter type that transfers rotating power from engine speed to an output driven load with fluid inside of Converter - Low speed / Heavy load : Low gears(1~3) - High speed / Light load : High gears(4~5) ✓ Fine dynamic characteristic

HL975A CVT

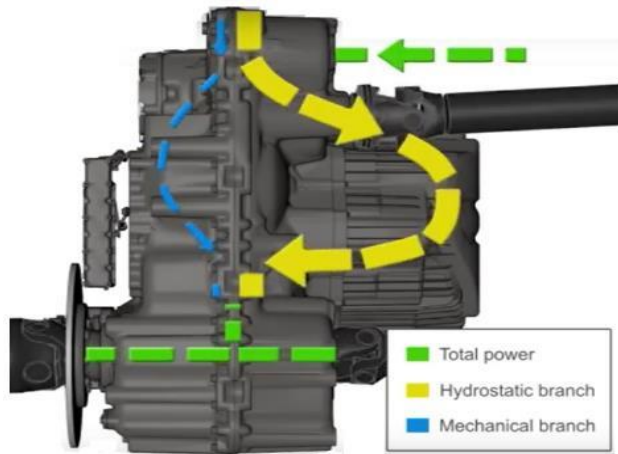
Continuously Variable Transmission

- Fuel Savings by reduction of max. engine speed
- Hydrostatic-mechanic power-splitting with continuously variable drive
- Reduction of engine speed independent of driving Speed (only up to 1800 rpm)
- Reduced fuel consumption by ~25- 35% vs 4- speed/ 5- speed Hydro Dynamic Transmission (HDT)

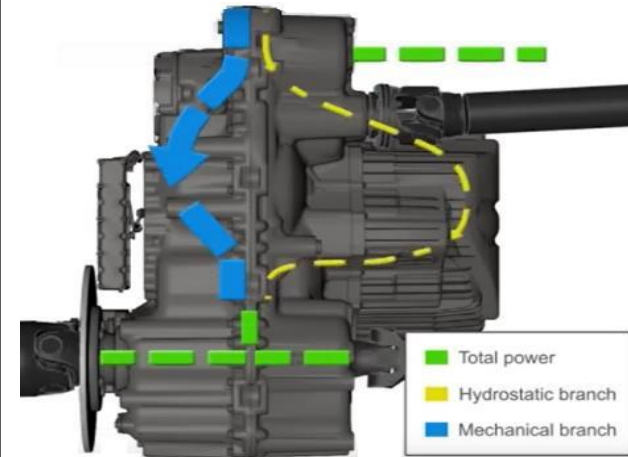
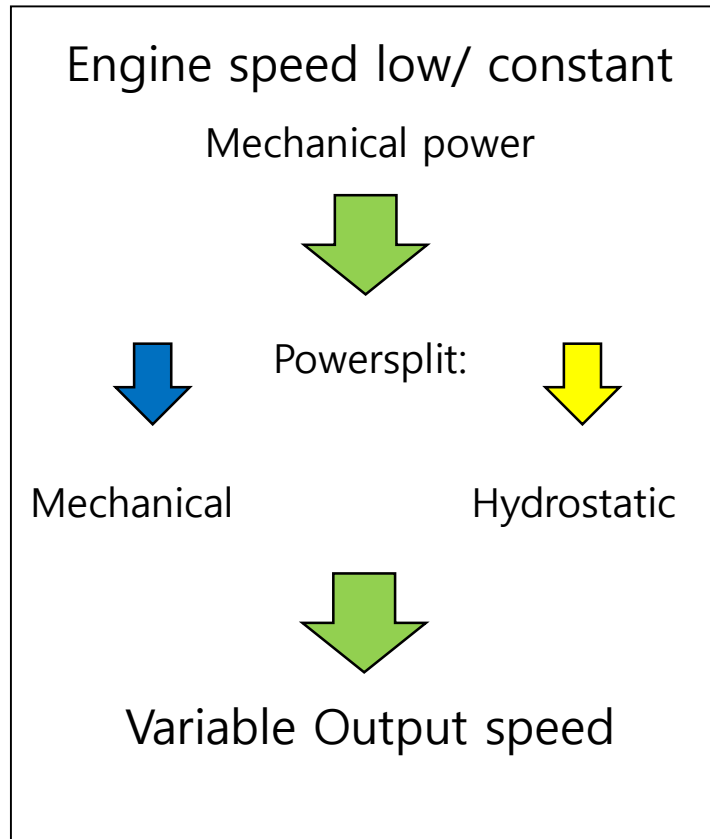


HL975A CVT

Continuously Variable Transmission



Low speed



High speed



HL975A CVT

CVT - New function (1/2)



Acceleration / Deceleration / Shuttle Response rate control

Three different response rates can be selected

- Allows to control job cycle time along with driving comfort

- Able to balance the vehicle dynamic motion as user preference

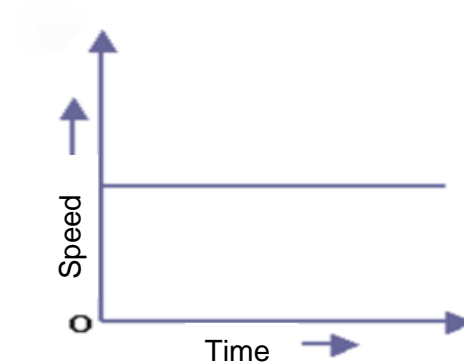
- ① Acceleration : Adjust rate of vehicle speed change after press accel. pedal
- ② Deceleration : Adjust rate of vehicle speed change after release accel. pedal
(Independent of brake pedal use)
- ③ Shuttle Shift : Changes FWD ↔ REV speed rate

Creep Mode

Maintain constant speed at engine idle without pressing accel. pedal

- To achieve similar driving motion as HDT

- Useful for very low-speed application where steady vehicle speed is required (example : snow removing / leveling)



HL975A CVT

CVT - New function (2/2)



Traction Mode

Allow to choose optimal traction amount depends on ground condition from Smooth to Rough range
(example : minimizing traction amount on muddy ground)

- Minimize wasted energy on tire slippage
- Minimize tire wear ⇒ saves tire maintenance cost!

Virtual Gear Speed Limit Setting

Choose speed limit in each gear selection

- Adjust machine to proper driving range for various job environment
(example : low speed setting in narrow area such as waste handling site)
- More efficient driving
(not using unnecessary high engine speed required range)



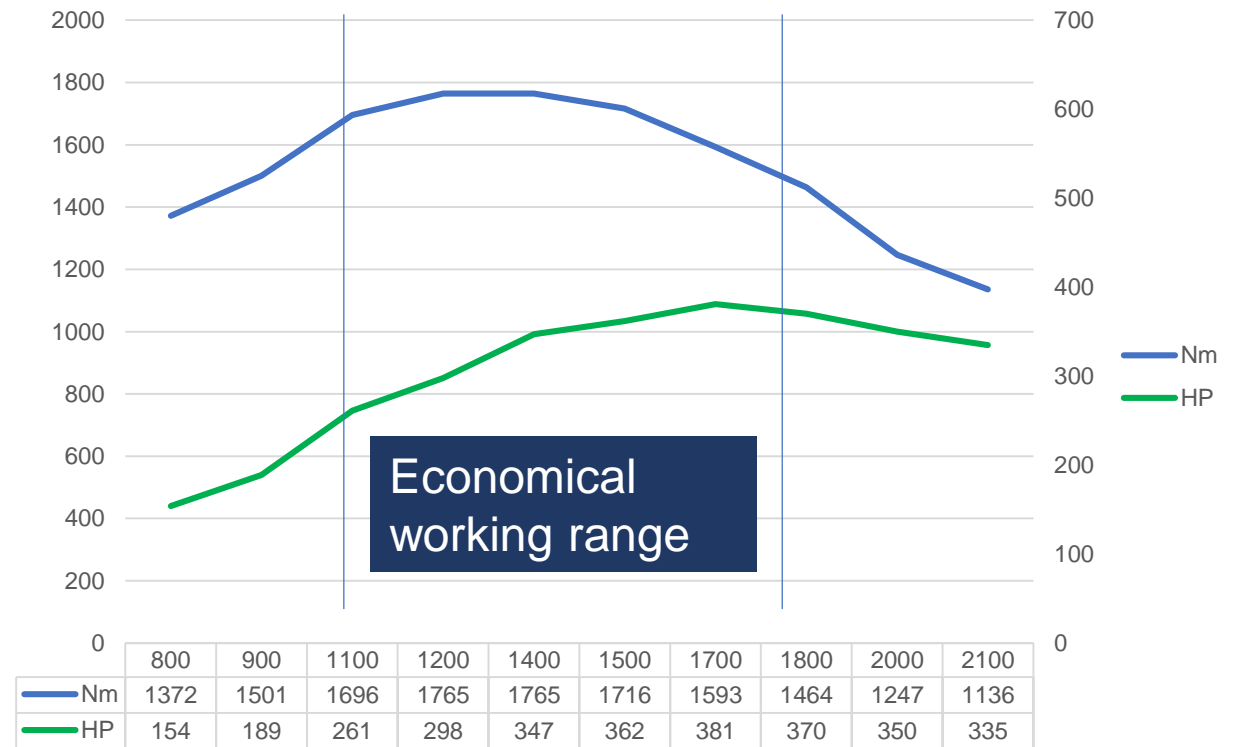
HL975A CVT

Continuous Variable Transmission

- Fuel Savings
- wide, low rpm working range.
- optimized engine performance



HL975A CVT - X12- Engine performance Curve



Design & Safety

New Design

Grey boom

Aesthetic

- strong robust appearance

Brand image

- easy recognizable amongst competition

Brand quality

- stains from oil, dirt, grease not easily visible

Brand visibility

- easily distinguish an A-Series machine in the field



New Engine Hood Design

Direct visibility to rear counterweight

- Reshaped engine hood
- Exhaust and air intake in line



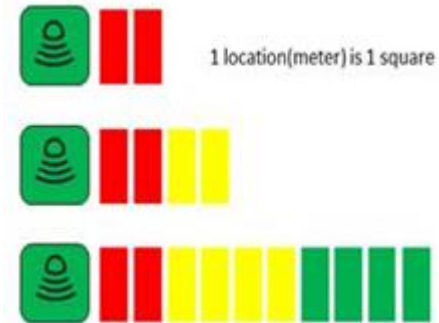
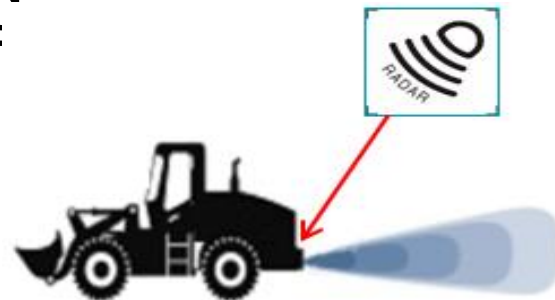
- Safety
- Confident feeling



Radar rear

Radar with separate Monitor

- detect rear object (similar to cars)
- no dead zone/ max. detection range is 10m
- quick + reliable detection during day and night
- object within 7m -> audible alarm
- increased safety on narrow sites
- confident feeling



AAVM + Radar

Combination of 2 safety systems

AVM



It displays the position of people with a top view.

IMOD

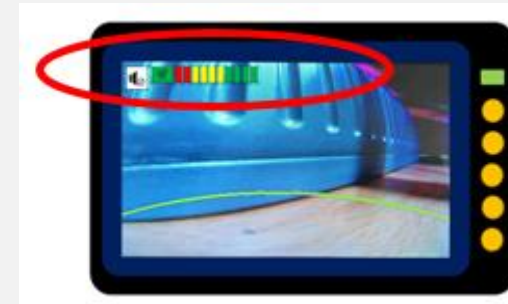


A blue warning sign
people move in
within a 5-meters radius.



A red warning sign
people move in
within a 3-meters radius

Radar



Radar is active when machine is moving. 10m detection area/
object <7m = audible alarm

- Radar when machine is moving to rear
- AAVM + IMOD before and during slow moving of machine
- increased safety as combination of both systems
- confident feeling

Seatbelt warning alarm

Detection of seat belt engaged

- Visual and audible warning
- safety for operators



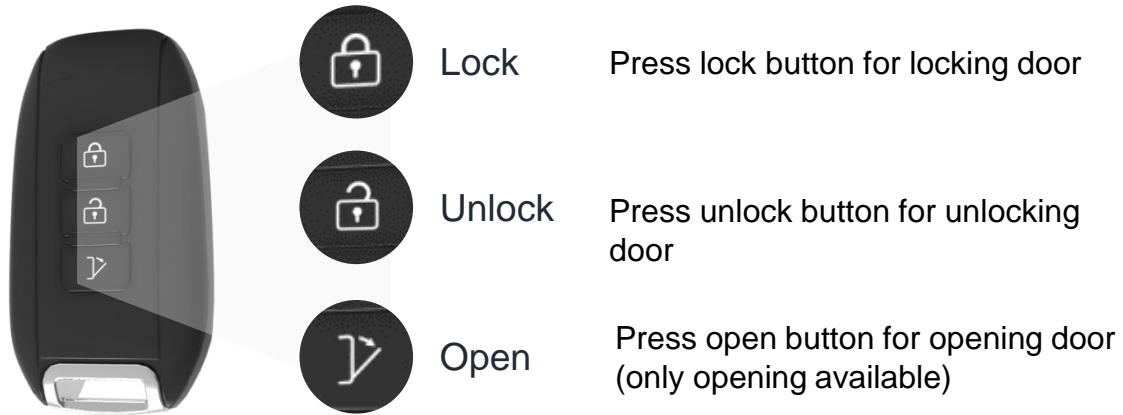
Control logic		Startup status	
		KEY ON	IGNITION
Seatbelt Switch	Belt ON	Warning sign OFF Warning alarm OFF	Warning sign OFF Warning alarm OFF
	Belt OFF (over 2 sec.)	Warning sign ON Warning alarm OFF	Warning sign ON Warning alarm ON

Comfort

Remote door system

New optional remote door opening system

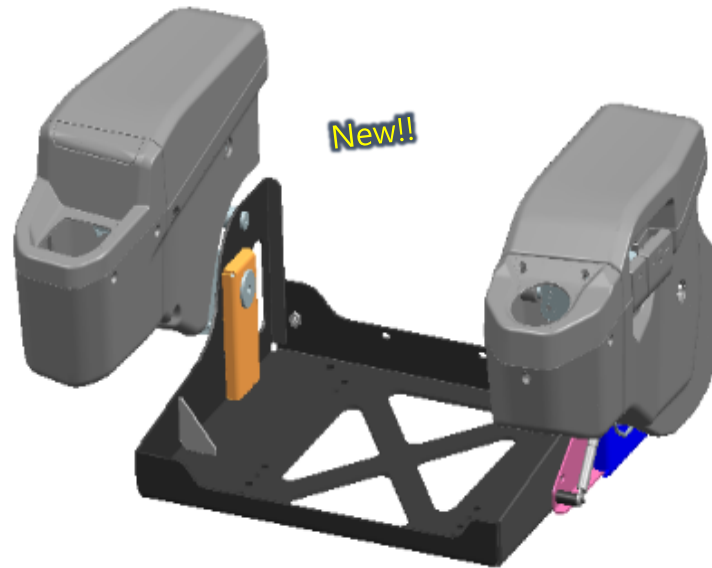
- Operator can open the cabin door remotely from ground floor.
- Safety
- Convenience



New wide Armrest

Indepent 4-way adjustable armrest

- Perfectly adjustable to operator
- The LH armrest is tilt able for easy cabin access
- individual fit
- less fatigue
- more comfort



1 RH, LH SIDE

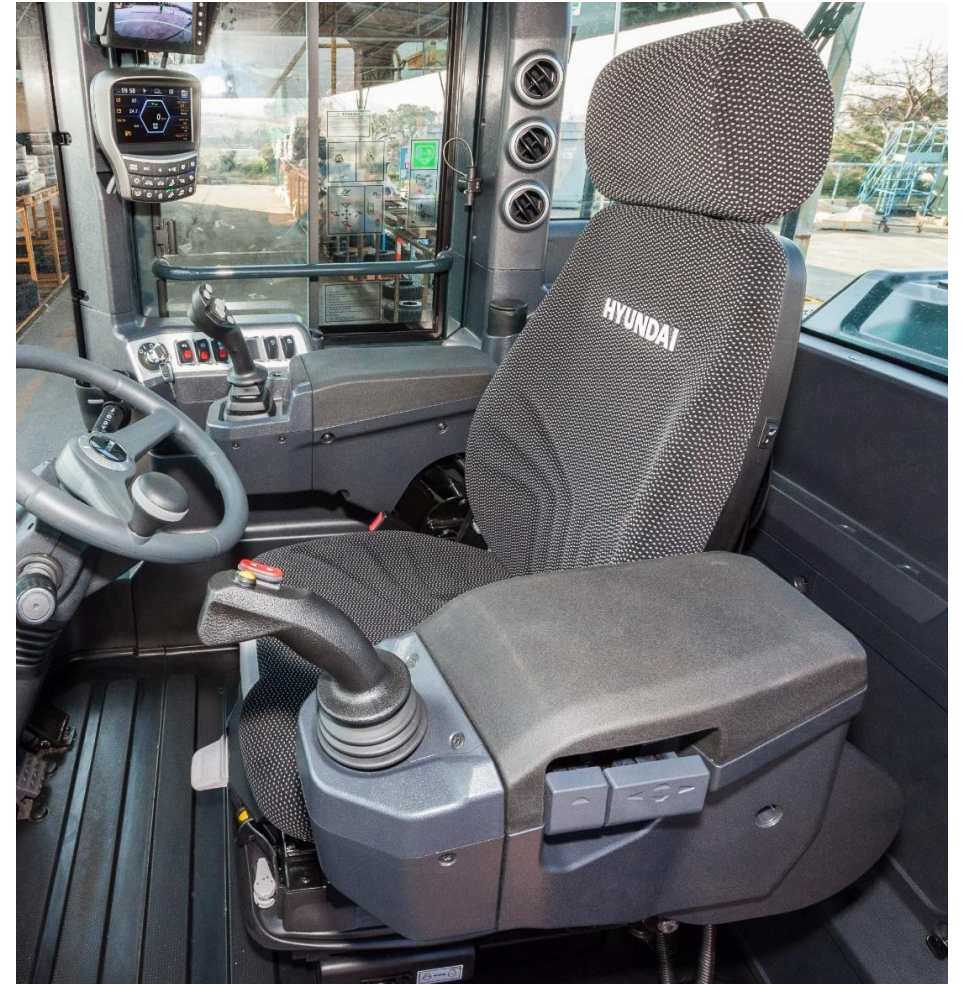
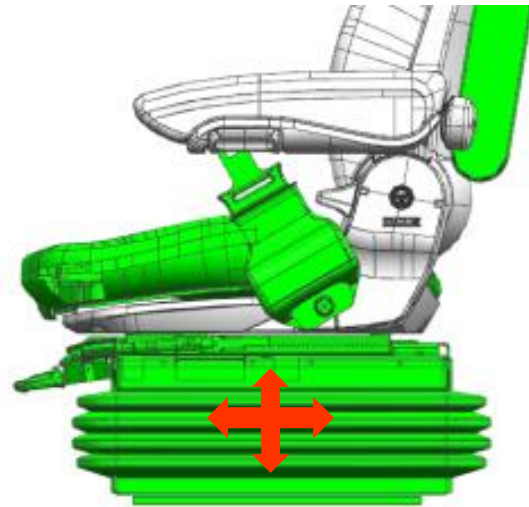


2 LH SIDE

Premium Seat

4-way air suspended heated Seat

- RCV in armrest integrated
- less fatigue during long days
- more comfort



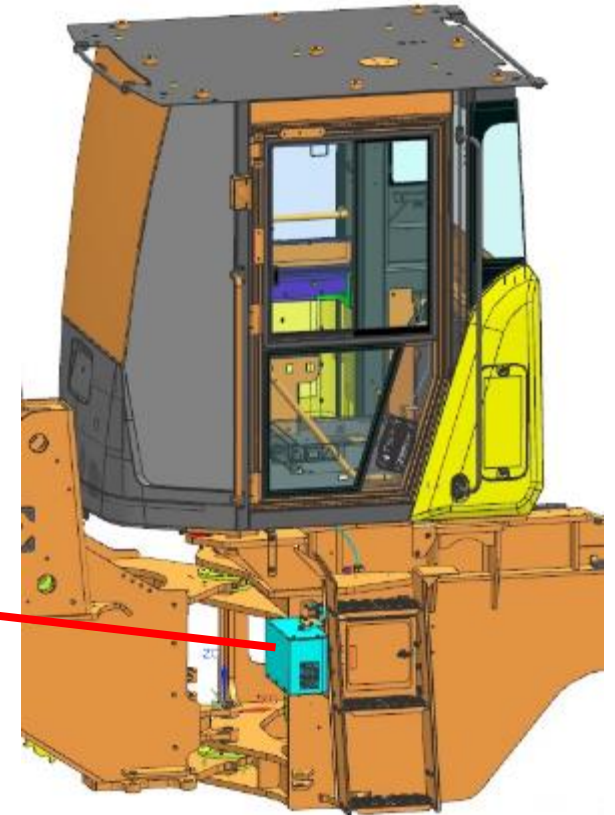
Air Compressor

Optional air gun for cleaning cabin room



Air gun is mounted inside the cabin

Compressor box is mounted ladder side (Electricity, Tankless type)



- convenient cleaning of cabin + fresh air filters

Integrated Technologies

Z-Bar + PZ-Bar + Toolmaster

Right offering for right job



Standard: Z-bar
Loading applications
Fast cycle time
Simple design
High breakout force



HL940A/ HL955A: PZ-Kinematic



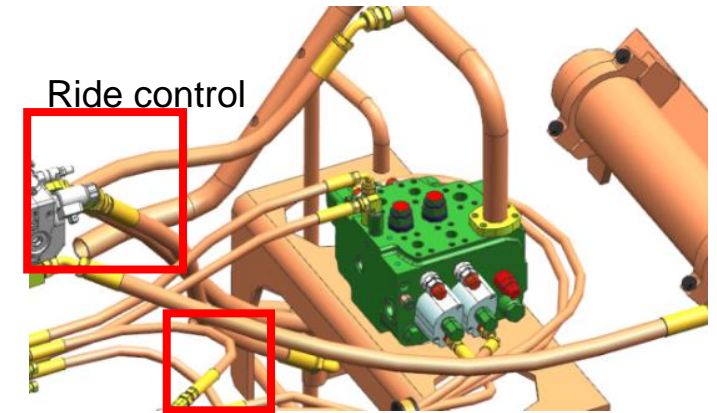
TM: Parallel cylinders
Industrial/ agricultural
applications
Parallel lift
High tilt back forces



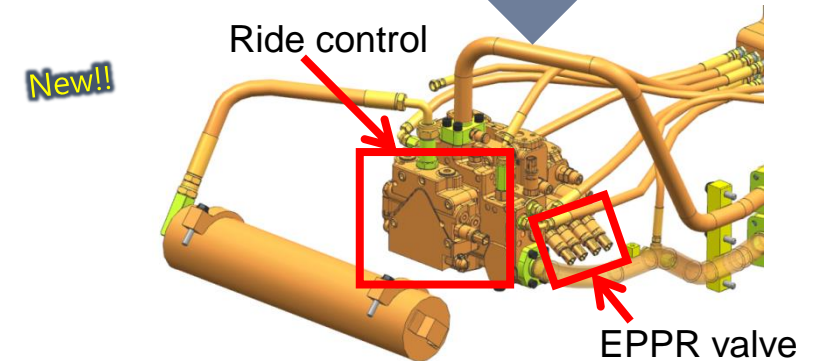
All-in-one Main Control Valve

Integration of Ride Control Valve and EPPR Valve

- Simple layout
- Less hydraulic hoses
- Less risk of damages with leaks
- Increased Uptime
- Fuel savings (pumping losses)



EPPR valve



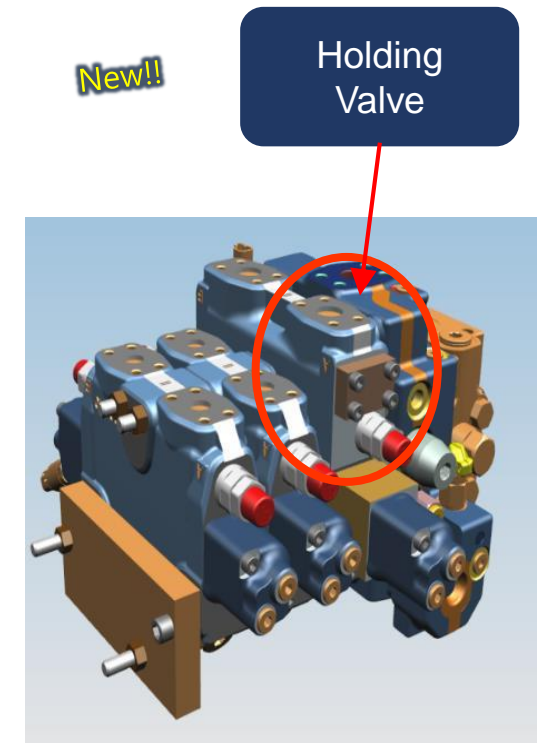
MODEL	HL930A(TM)	HL940A(TM)	HL955A(TM)	HL960A	HL970A	HL975A CVT	HL980A
Ride control	v	v	v	v	v	-	-
EPPR valve	-	-	v	v	v	-	-

Boom holding valve

New All in One MCV with integrated Boom Holding valve

- No boom drop while waiting for next truck
- NOTE: No Hose Rupture Valve!

- Safety/ Convenience
- Fuel savings (no “losses”)

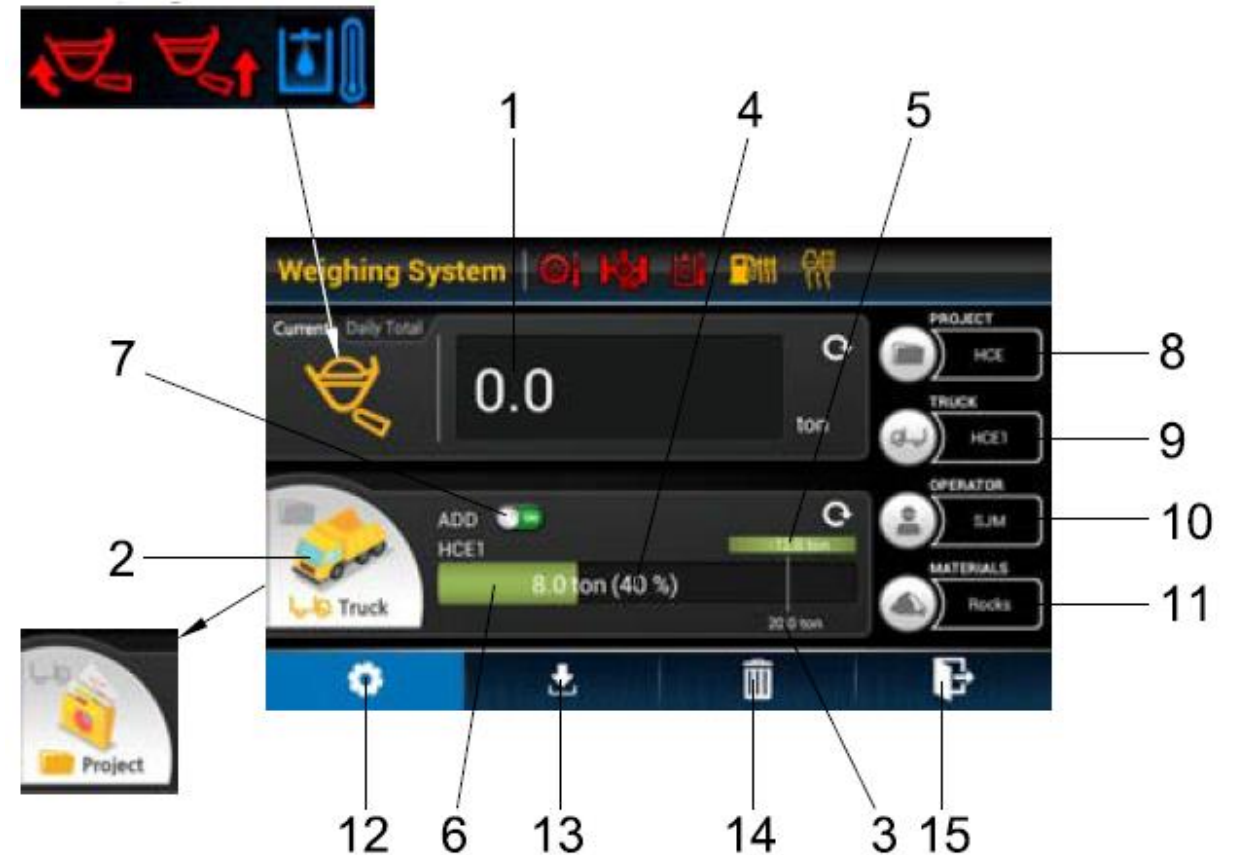


MODEL	HL930A(TM)	HL940A(TM)	HL955A(TM)	HL960A	HL970A	HL975A CVT	HL980A
Boom Holding valve	v	v	v	v	v	-	-

Weighing System

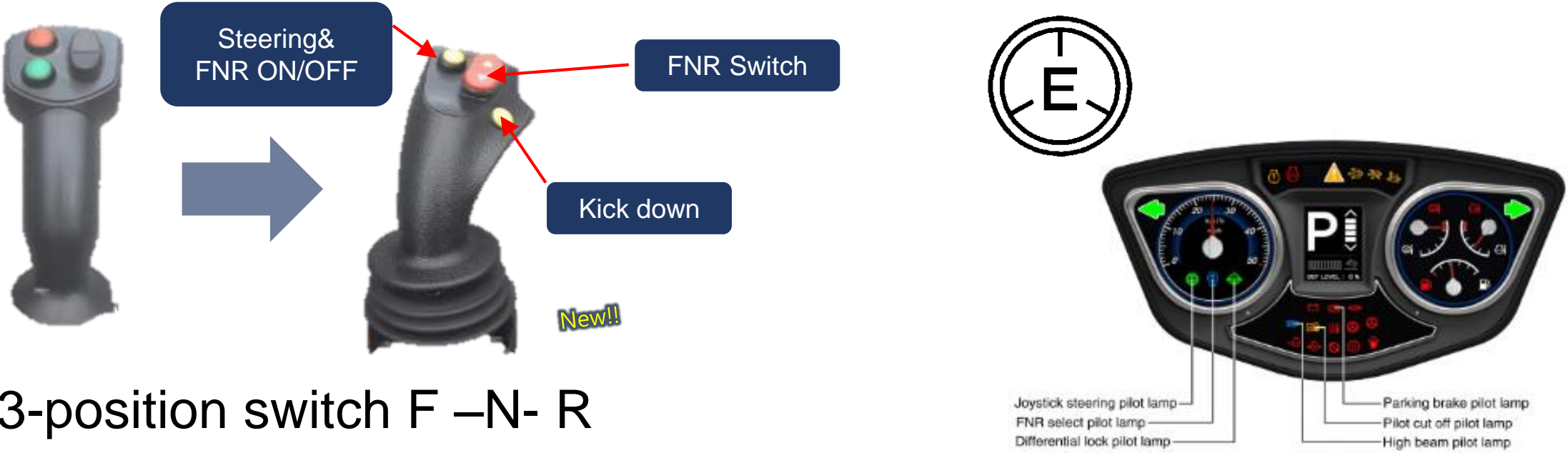
New Screen + Functions

- 1 Current weight in the bucket / Daily total weight
- 2 Select button (Click gray icon) for status (Project status / Truck status)
- 3 Target weight
- 4 Loaded weight
- 5 Remaining weight to complete job/ over weight to complete job
- 6 Progress bar / Total weight
- 7 Select button for mode (Standby mode / Weigh mode)
- 8 Project name
- 9 Truck name
- 10 Operator
- 11 Materials
- 12 Go to Work load setting menu
- 13 Save Work log to USB
- 14 Delete Work log
- 15 Go to Main menu



Electronic Joystick steering lever

New electronic Joystick steering lever with ergonomic design



- 3-position switch F –N- R
- New option for HL940A *New!!*
- More comfort
- Less Fatigue during long working days

MODEL	HL930A(TM)	HL940A(TM)	HL955A(TM)	HL960A	HL970A	HL975A CVT	HL980A
Apply	N/A	v	v	v	v	v	v

Owner Menu



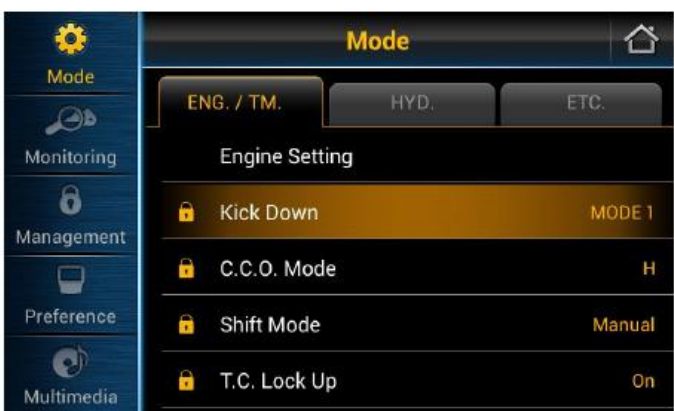
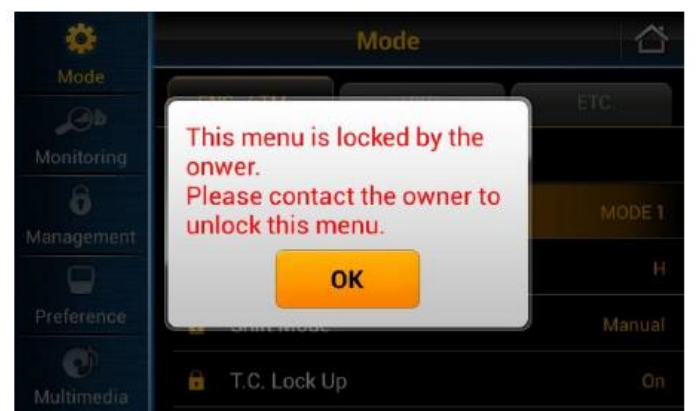
Owner Menu

- Protection of several adjustments by using Password (Default: 11111)
- Owner can be sure that machines are operated according to his requirements (i.e. Economy/ Lock up/ etc.).



Owner Menu

Details

 <table border="1"><thead><tr><th>Item</th><th>Current Data</th><th></th></tr></thead><tbody><tr><td>Engine Mode</td><td>ECOND</td><td><input type="checkbox"/></td></tr><tr><td>C.C.O. Mode</td><td>OFF</td><td><input type="checkbox"/></td></tr><tr><td>Shift Mode</td><td>MANUAL</td><td><input type="checkbox"/></td></tr><tr><td>T.C. Lock Up</td><td>OFF</td><td><input type="checkbox"/></td></tr><tr><td>Ride Control</td><td>OFF</td><td><input type="checkbox"/></td></tr><tr><td>Weighing System</td><td>Automatic</td><td><input type="checkbox"/></td></tr></tbody></table>	Item	Current Data		Engine Mode	ECOND	<input type="checkbox"/>	C.C.O. Mode	OFF	<input type="checkbox"/>	Shift Mode	MANUAL	<input type="checkbox"/>	T.C. Lock Up	OFF	<input type="checkbox"/>	Ride Control	OFF	<input type="checkbox"/>	Weighing System	Automatic	<input type="checkbox"/>	
Item	Current Data																					
Engine Mode	ECOND	<input type="checkbox"/>																				
C.C.O. Mode	OFF	<input type="checkbox"/>																				
Shift Mode	MANUAL	<input type="checkbox"/>																				
T.C. Lock Up	OFF	<input type="checkbox"/>																				
Ride Control	OFF	<input type="checkbox"/>																				
Weighing System	Automatic	<input type="checkbox"/>																				
1) Choose functions to lock on Menu List	2) Owner Menu Editing - Enable																					
 <table border="1"><thead><tr><th>Item</th><th>Current Data</th></tr></thead><tbody><tr><td>ENG. / TM.</td><td>HYD. ETC.</td></tr><tr><td>Engine Setting</td><td></td></tr><tr><td>Kick Down</td><td>MODE 1</td></tr><tr><td>C.C.O. Mode</td><td>H</td></tr><tr><td>Shift Mode</td><td>Manual</td></tr><tr><td>T.C. Lock Up</td><td>On</td></tr></tbody></table>	Item	Current Data	ENG. / TM.	HYD. ETC.	Engine Setting		Kick Down	MODE 1	C.C.O. Mode	H	Shift Mode	Manual	T.C. Lock Up	On								
Item	Current Data																					
ENG. / TM.	HYD. ETC.																					
Engine Setting																						
Kick Down	MODE 1																					
C.C.O. Mode	H																					
Shift Mode	Manual																					
T.C. Lock Up	On																					
Applied screen example	POP UP when driver touch the locked menu																					

Eco Report

Efficiency Monitoring

- Eco Report gives indication about operation efficiency each machine start up
- 3 aspects
- Shuttle shifting under high speed condition
- Idle time
- Hydraulic pressure under relief condition



Service & Services

Increased Service Intervals

Fuel Filter + Engine Oil + Filter

- 800h/ 1000h Engine oil
HL940A-HL960A = 800h
HL970A-HL980A = 1.000h
- 1000h Fuel filter
- 1000h TM/ Axle/Air filter
- 2000h Coolant
- 5000h HCE long life Hydraulic oil
- Depending on local conditions

4) EVERY 250 HOURS SERVICE

Check items	Service	Page
Wheel nuts	Check, Tight	6-41, 42
Battery (voltage) / Battery cable and connections	Check	6-53, 54
Air conditioner and heater filter (inner and outer)	Check, Clean	6-56

5) EVERY 500 HOURS SERVICE

Check items	Service	Page
Radiator, oil cooler, change air cooler, condenser	Check, Clean	6-21
Air cleaner element (primary)*	Clean	6-27

* When working in dusty environments, more frequent cleaning is highly recommended.

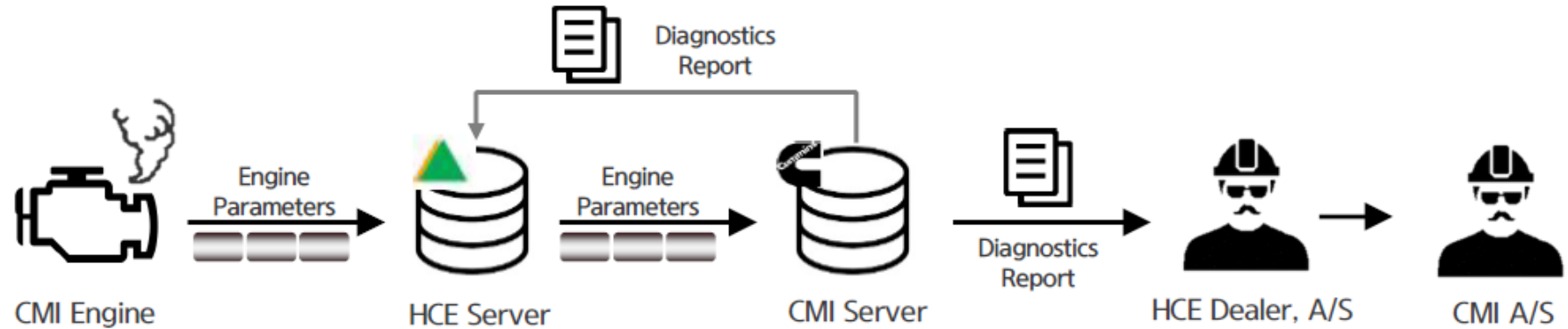
6) EVERY 1000 HOURS SERVICE

Check items	Service	Page
Engine oil *	Change	6-15, 16, 17
Engine oil filter *	Replace	6-15, 16, 17
Fuel filter element	Replace	6-29
Fuel pre-filter element	Replace	6-29
Drive belt, cooling fan, belt tensioner	Check	6-22, 23
Hydraulic oil return filter	Replace	6-39
Pilot line filter element	Replace	6-40
Hydraulic tank air breather element	Replace	6-40
Pressure filter element	Lubricate	6-40
Center pivot pin	Change	6-48
Transmission oil	Replace	6-44, 45
Transmission oil filter	Replace	6-45
Aircon and heater outer filter	Replace	6-56

* Change oil and filter every 500 hours when using API CJ-4.

ECD

Engine Connected Diagnostics



- Cummins engine platform -> 1 supplier
- Dealer can apply for Cummins Self Service via HCEE
- Quick reaction + 1 way stop
- Limited down time



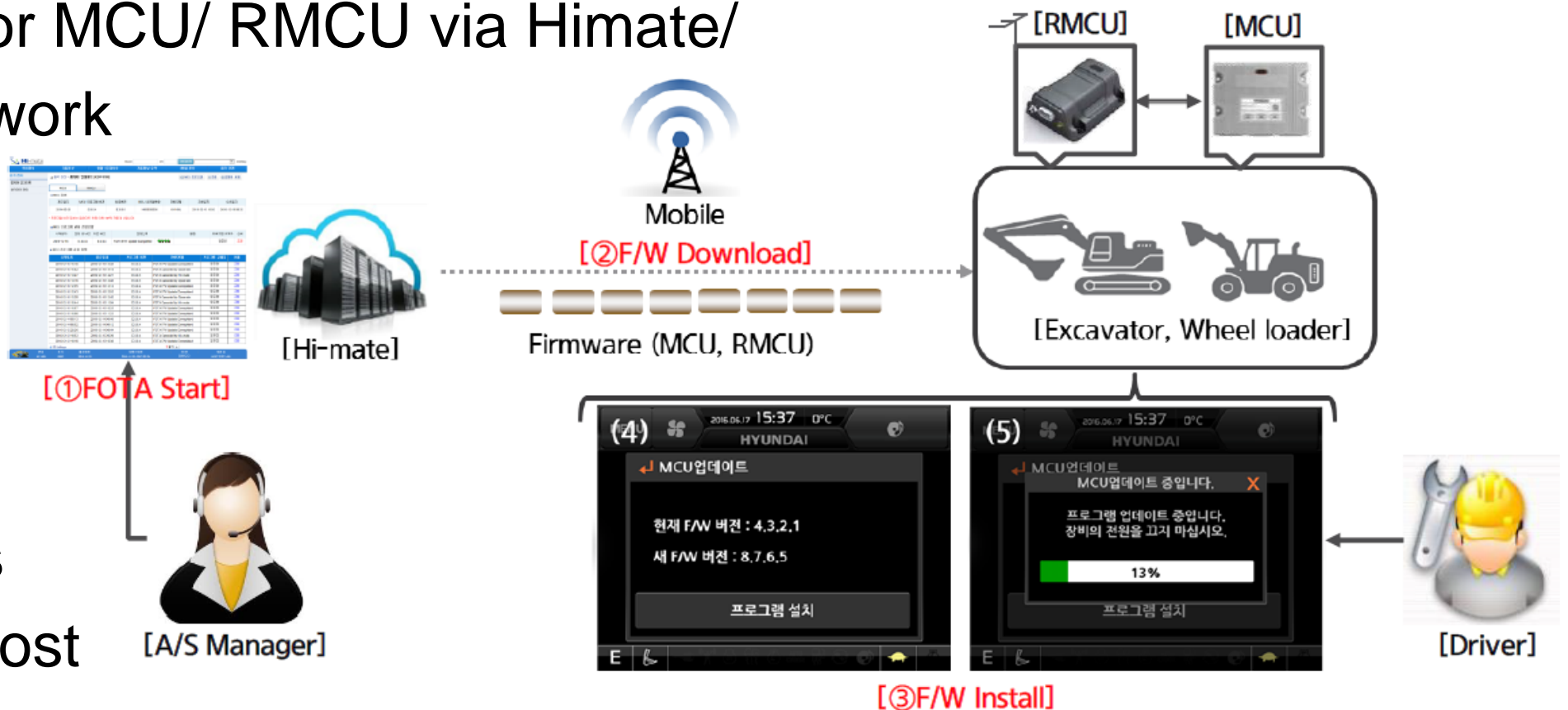
The image shows two examples of diagnostic data delivery. On the left is an **[E-mail]** screenshot of a diagnostic report. On the right is a **[Mobile App]** screenshot showing diagnostic details on a smartphone.

Suggested Root Causes:	Probability
Component or System	
Turbocharger	43%
Turbocharger Actuator	33%
Engine Control Module Calibration	14%

FOTA

Firmware over the air

- Software for MCU/ RMCU via Himate/ Mobile network



- Quick fixes
- Reduced cost

Durability improvements

Increased axle capacity for durability

Heavy duty axle option

- Heavy duty axle option is applied on HL955A / HL960A / HL980A
- HL955A / HL960A / HL970A Rear Axle Capacity is increased for better durability
- HL930A Front and Rear axles are increased for better durability

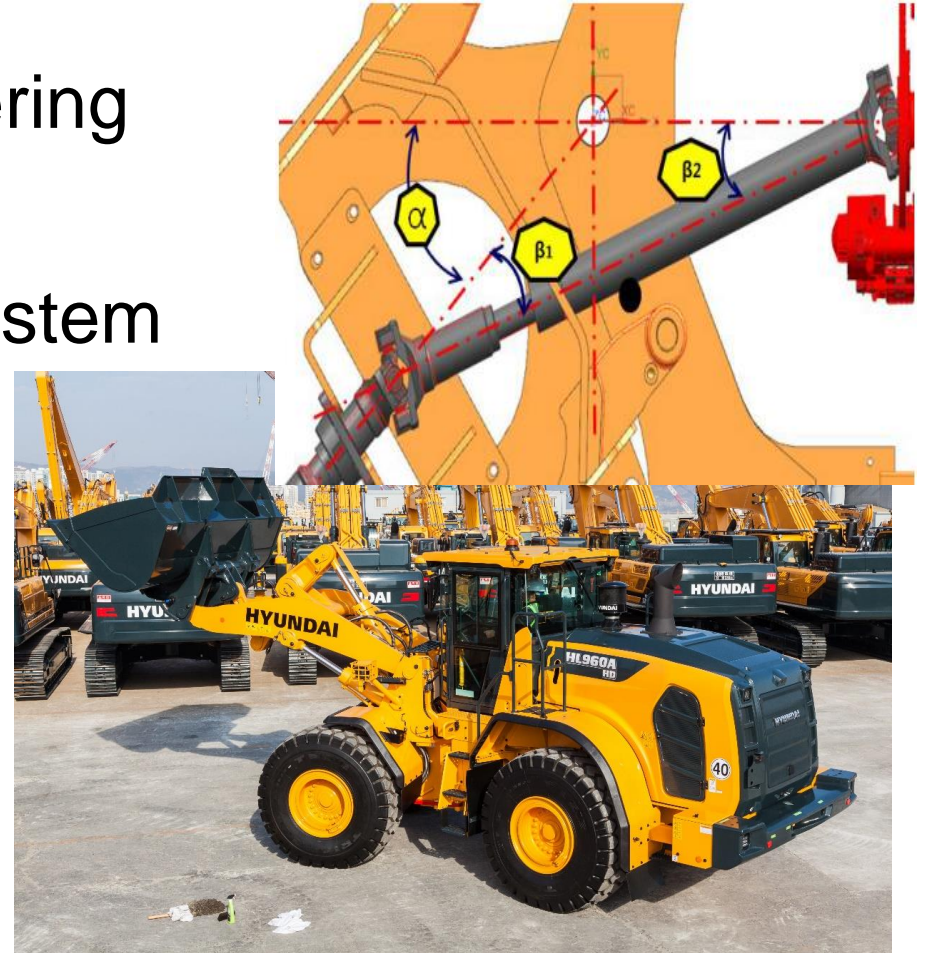
Model		HL730-9A	HL930A	HL940	HL940A	HL955	HL955A	HL960	HL960A	HL970	HL970A	HL975	HL975A CVT	HL980	HL980A
Front	Model	L3055II	L3065II	L3075II	←	L3085II	← (L3095II)	L3095II	← (L3105II)	L3105II	←	L3115II	←	L3125II (L3135II)	←
	Load Capacity (Dynamic, ton)	10.4	11.0	13.0	←	16.0	← (19.0)	19.0	← (25.0)	25.0	←	28.0	←	35.0 (35.0)	←
	Ratio(%)	100%	106%	100%	←	100%	← (119%)	100%	← (132%)	100%	←	100%	←	100%	←
Rear	Model	L3055II	L3065II	L3075II	←	L3075II	L3085II	L3085II	L3095II	L3095II	L3105II	L3105II	←	L3115II (L3135II)	←
	Load Capacity (Dynamic, Kg)	10.4	11.0	13.0	←	13.0	16.0	16.0	19.0	19.0	25.0	25.0	←	28.0 (35.0)	←
	Ratio(%)	100%	106%	100%	←	100%	123%	100%	119%	100%	132%	100%	←	100%	←

() is heavy duty axle option

Improved Drive Line System

Improved angle difference in center drive line [Beta1 = Beta 2]

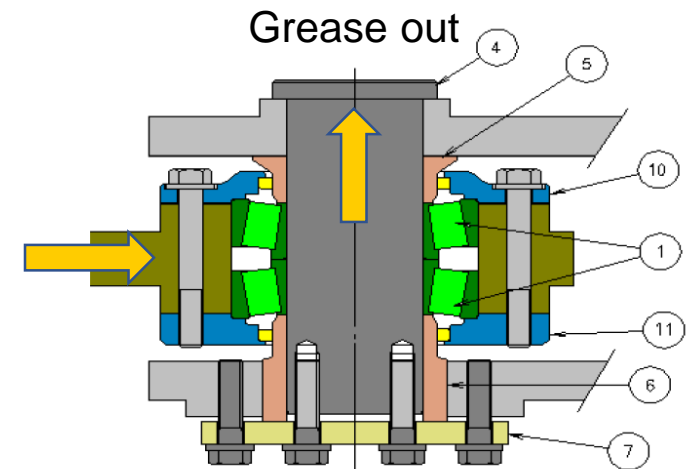
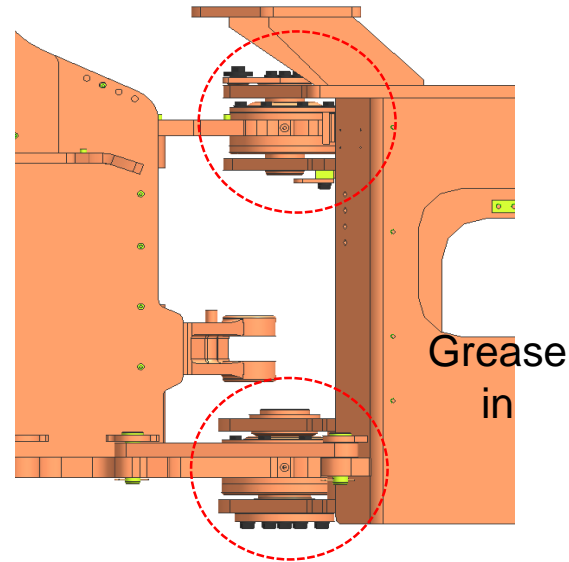
- minimized angle difference during steering
 - Reduced vibration during steering
 - Increased quality in whole drive line system
-
- Durability increased
 - Driving Comfort increased



Improved center pivot bearing

Seal type has been changed (dust seal -> oil seal)

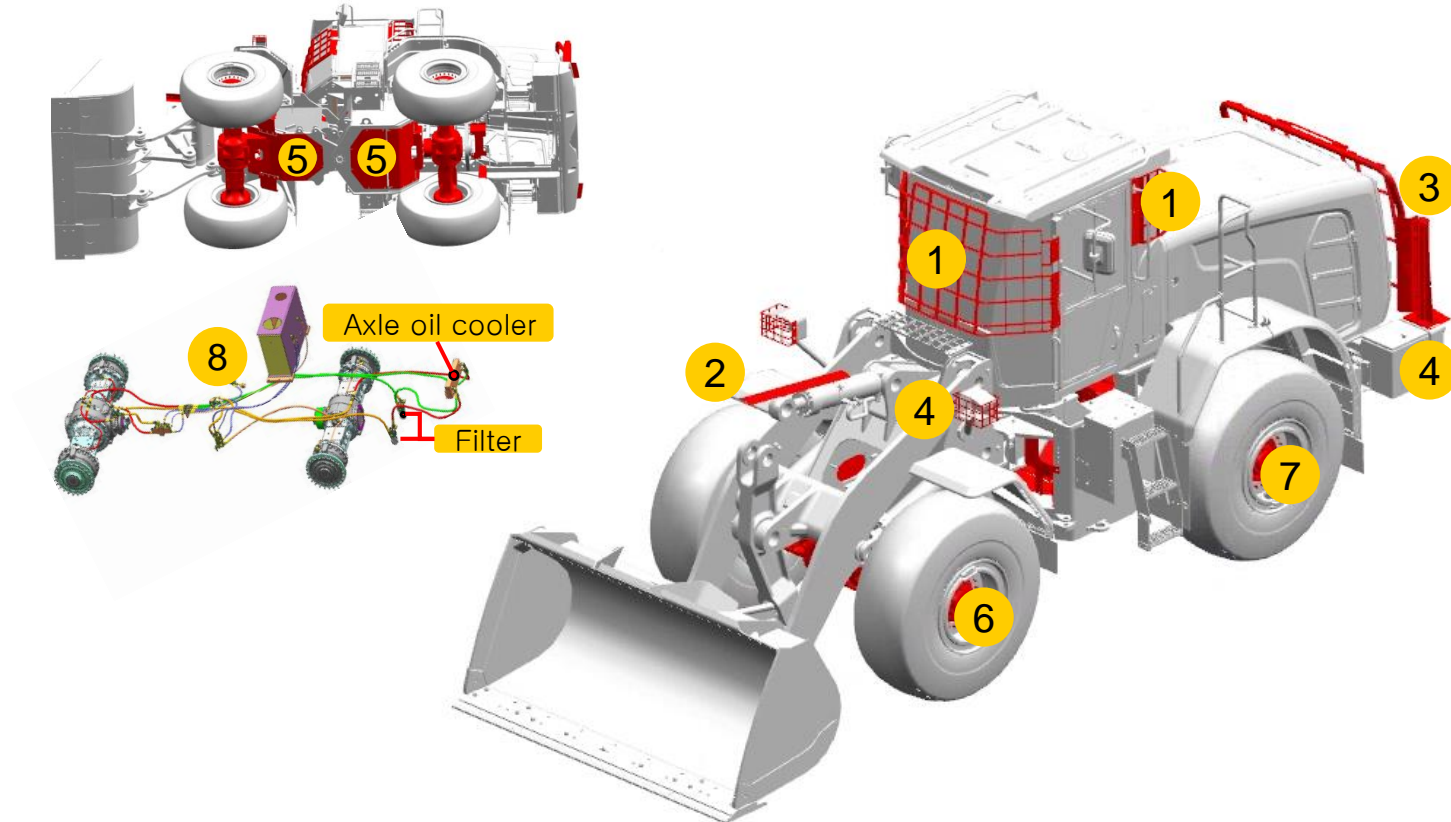
- increased bearing durability
- minimized grease oil leakage
- Center Pivot Bearing meets industry standard
- Increased machine uptime
- meet market demands



Cowl

Customized solutions for industrial sector(HL960A HD)

HL960A HD provide waste handling package option.
[LCG06 also for HL955A/ HL960A/ HL970A]



Cabin guard (LCG06)

1 Cabin guard (Front, Rear)

W/H Full guard (LLU03)

2 Cylinder guard

3 Rear grill guard

4 Lamp guard

5 Under guard (Front, rear)

Heavy Duty Axle (LXF07,LXR07)

6 Front HD axle

7 Rear HD axle

Dual Axle cooling (LXC02)

8 Dual axle cooling (Front, Rear)

READY FOR THE FUTURE



NEW HYUNDAI A-Series