DEUTZ FAHR

SAME DEUTZ-FAHR DEUTSCHLAND GmbH

WORKSHOP MANUAL

Combine

5650 H, 5660 HTS
5670 H / HTS
5680 H, 5690 HTS

Summary 5650H – 5690HTS

General Safety Instructions

Before starting assembly, repair or maintenance work, make sure you read and follow these safety instructions. Please also transmit all safety instructions to all other people concerned.
In this manual, we have marked all points relevant to your safety with the following symbol:

WARNING!

This combine harvester is designed exclusively for normal use in agricultural work (intended use).

Any use of the machine beyond the above description does not conform to the intended use. The manufacturer shall not accept any liability for any damage resulting from such use; the user shall bear all risks relating to such use.

Conformity with the intended use includes adherence to the operating, servicing and maintenance conditions specified by the manufacturer.

This combine harvester may only be operated, serviced and repaired by persons familiar with the machine and instructed in the dangers involved.

The manufacturer shall not accept any liability for any damage resulting from modifications to the machine by persons not authorised by the manufacturer.

General regulations on safety and accident prevention:

1. In addition to the instructions contained in this manual, you must strictly follow all relevant accident prevention regulations and other generally recognised rules of technical and occupational safety. The legal operating specifications laid down in the Operating Manual for driving the combine on the road and for working use also apply to this manual and must therefore also be observed.

2. Before starting the engine, make sure that no gear is engaged or, in the case of hydromatic systems, that the drive lever is in the '0' position, and that all protective devices are fitted and in the protection position.

3. Only start the engine from the driver's cab. The engine must not be started by short-circuiting the electrical connections of the starter motor, because otherwise the machine may start moving immediately.

4. Before driving off, check the zone immediately around the combine harvester. Make sure you have sufficient visibility. Sound the horn as a warning signal.

5. Do not leave the engine running in enclosed spaces.

6. On leaving the combine harvester, protect it from rolling free (parking brake, wheel chock). Switch off the engine and remove the key. If applicable, lock the cab door.

7. Before leaving the combine, fully lower all front attachments (cutting table etc.).

8. Take care when handling fuel – increased fire risk. Never refuel the combine close to naked flames or ignitable sparks. Do not smoke when refuelling.

9. Before refuelling, switch off the engine. Do not refuel in enclosed areas. Immediately wipe away any spilt fuel.

10. To prevent fire risk, keep the machine clean.

11. Take care when handling brake fluid and battery acid (toxic and liable to cause chemical burns).

Safety instructions for maintenance and repair

General:

1. As a general rule, the drive train must be disengaged and the engine stopped before carrying out any assembly, repair, maintenance and cleaning work or before remedying malfunctions.
   Remove the ignition key.

2. Fluids escaping at high pressure (fuel, hydraulic oil etc.) can pierce the skin and cause severe injury.
   In the event of injury, immediately call a doctor, because otherwise there is a grave risk of infection.

3. Care is required when handling fuel – increased fire risk. Never refuel the combine close to naked flames or ignitable sparks. Do not smoke when refuelling.

4. To prevent fire risk, keep the machine clean.

Electrical system:

1. When working on the electrical system, always remove the cable from the negative pole of the battery.

2. Make sure that the battery is correctly connected. First connect the positive pole and then the negative.

3. Take care with battery gases, since they are highly explosive.
   Avoid generating sparks or naked flames close to batteries.

4. Only use OEM fuses of the specified ratings. If any of the fuses used are too highly rated, the electrical system may be destroyed.

5. Before starting any electric welding work on the combine harvester, disconnect the cables from the alternator and battery.

6. Take care when handling battery acid (toxic and corrosive).

7. Only operate the starter motor for a limited period, because otherwise the winding will overheat.
   Allow the starter to cool down.

Brakes, brake fluid:

1. Check that the brakes are working correctly before each use.

2. The brake systems must be regularly submitted to a thorough test.

3. Settings and repairs to the brake system must only be carried out by qualified workshops or recognised brake services.

4. When driving on public roads, the individual wheel braking mode must be deactivated
   (interlock the pedals).

5. Regularly check the brake fluid level. Only use the specified brake fluid and change as specified.

6. Take care when handling brake fluid (toxic and liable to cause chemical burns).
   Do not spill brake fluid.

7. Dispose of brake fluid in accordance with the applicable regulations.

Safety instructions for maintenance and repair

Hydraulic system:

1. The hydraulic system is under high pressure. When searching for leaks, use a suitable aid (e.g. piece of cardboard) to protect against the risk of injury.

2. Before carrying out any work on the hydraulic system, depressurise the system and lower any front attachments.

3. When working on the hydraulic system, switch off the engine and remove the key. Prevent the combine harvester from rolling (handbrake, wheel chocks).

4. When connecting hydraulic equipment, make sure that the hydraulic hoses are correctly connected. If the hoses are connected to the wrong points, the switch functions will be inverted (e.g. raise/lower). Risk of accident.

5. Regularly inspect hydraulic hoses and replace if damaged or aged. The replacement hoses must conform to the technical specifications of the device manufacturer.

6. The hydraulic accumulator contains pressurised gas. Do not drop the accumulator or expose it to temperatures above 150°C

Air conditioning system:

1. Avoid all contact with the liquid refrigerant of the air conditioning system. If refrigerant is sprayed into the eyes, call a doctor immediately.

2. All maintenance, installation and repair work must be carried out exclusively by qualified personnel.

3. No welding work may be performed on components of the refrigerant circuit or in its immediate vicinity. Risk of poisonous fumes.

4. Maximum ambient temperature for refrigerant: 80°C.

5. When draining the air conditioning system, dispose of the refrigerant in accordance with the applicable regulations.

Tyres, screwed fixings:

1. When working on the wheels, make sure that the combine harvester is safely immobilised and prevented from rolling (wheel chocks).

2. When working under the jacked combine, allow no-one on the machine.

3. Make sure that the lifting device has sufficient load-bearing capacity.

4. Removing and refitting tyres requires sufficient knowledge and specified fitting tools.

5. Check the tyre pressures regularly. Excessive tyre pressure leads to a risk of bursting.

6. All fixing screws and nuts for the front and rear wheels and track adjusting components must be retightened in accordance with the manufacturer's specifications.

7. This retightening is also required after each track adjustment and wheel change.

Safety instructions for maintenance and repair

Engine:

1. Do not carry out maintenance work while the engine is running.
   Remove the ignition key.

2. When working on the engine, disconnect the battery (negative terminal).

3. Only refill the fuel tank when the engine is at standstill. Do not smoke while refuelling.

4. Take care whenever hot oil may be released – risk of burns.

5. Make sure that the oil and fuel used are of the specified quality, and only store them in approved containers.

6. Dispose of oils, fuels and filters in accordance with the relevant regulations.

Miscellaneous:

1. Before throwing away used and apparently empty pressurised cans (paint sprays etc.), empty them fully in a well-ventilated area away from sparks and naked flame.

2. If any parts have to be replaced, only authentic original DEUTZ-FAHR spare parts may be used.

   The use of spare parts, accessories and auxiliary devices that do not originate from DEUTZ-FAHR and are not tested and approved by DEUTZ-FAHR can have a negative effect on the specified characteristics or reliability and thereby detract from active and/or passive driving and working safety (accident protection etc.).

   DEUTZ-FAHR cannot accept any liability for any damage caused by the use of non-DEUTZ-FAHR original parts, accessories and auxiliary devices.

3. Replace all protective devices and guards after maintenance and repair work.

4. Do not carry out any welding, drilling, sawing and grinding work on the cab frame or the safety frame. Replace any damaged parts.

5. When replacing the cab ventilation filter, dispose of the used filter in accordance with regulations.

6. Auxiliary heaters must never be operated in closed rooms or during refuelling.

7. When carrying out electric welding work on the combine harvester, disconnect the alternator cable and battery.

Notes

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Conversion Tables

Conversion factor

1	mm	1,0	mm	0,03937	in.	0,00328	ft			
1	in.	25,4	mm	1,0	in.	0,08333	ft			
1	ft	304,8	mm	11,9999	in.	1,0	ft			
1	cm^2	1,0	cm^2	0,155	sq.in.					
1	sq.in.	6,4516	cm^2	1,0	sq.in.					
1	cm^3	1,0	cm^3	0,001	l	0,06102	cu.in.	0,00026477	USgall	0,00021998 Imp.gall
1	l	1000	cm^3	1,0	l	61,024	cu.in.	0,26417	USgall	0,21998 Imp.gall
1	cu.in.	16,3870	cm^3	0,016387	l	1,0	cu.in.	0,04329	USgall	0,03604 Imp.gall
1	US gall	3785,4	cm^3	3,7854	l	23,1	cu.in.	1,0	USgall	0,8327 Imp.gall
1	Imp.gall	4546	cm^3	4,546	l	277,41	cu.in.	1,20091	USgall	1,0 Imp.gall
1	g	1,0	g	0,001	kg	0,03527	oz	0,0022046	lbs	
1	kg	1000	g	1,0	kg	35,27	oz	2,2046	lbs	
1	oz	28,353	g	0,028353	kg	1,0	oz	0,0625	lbs	
1	lbs	453,59	g	0,45359	kg	15,9983	oz	1,0	lbs	
1	kp/cm^2	1,0	kp/cm^2	14,21	lbs/sq.in.	0,981	bar			
1	lbs/sq.in.	0,0703	kp/cm^2	1,0	lbs/sq.in.	0,06903	bar			
1	bar	1,0193	kp/cm^2	14,485	lbs/sq.in.	1,0	bar			
1	kpm	1,0	kpm	7,233	ft.lbs	9,81	Nm	0,981	daNm	
1	ft.lbs	0,1383	kpm	1,0	ft.lbs	1,356	Nm	0,1356	daNm	
1	Nm	0,1019	kpm	0,7373	ft.lbs	1,0	Nm	0,1	daNm	
1	daNm	1,019	kpm	7,373	ft.lbs	10,0	Nm	1,0	daNm	
1	PS	1,0	PS	0,98632	BHP	0,736	kW			
1	BHP	1,0139	PS	1,0	BHP	0,7462	kW			
1	kW	1,36	PS	1,3405	BHP	1,0	kW			

Conversion from mm to inches

mm	**0,0**	**0,1**	**0,2**	**0,3**	**0,4**	**0,5**	**0,6**	**0,7**	**0,8**	**0,9**
0	-	0,00394	0,00787	0,0118	0,0157	0,0197	0,0236	0,0276	0,0315	0,0354
1	0,0394	0,0433	0,0472	0,0512	0,0551	0,0591	0,0630	0,0669	0,0709	0,0748
2	0,0787	0,0827	0,0866	0,0906	0,0945	0,0984	0,1024	0,1063	0,1102	0,1142
3	0,1181	0,1220	0,1260	0,1299	0,1339	0,1378	0,1417	0,1457	0,1496	0,1535
4	0,1575	0,1614	0,1654	0,1693	0,1732	0,1771	0,1811	0,1850	0,1890	0,1929
5	0,1969	0,2008	0,2047	0,2087	0,2126	0,2165	0,2205	0,2244	0,2283	0,2323
6	0,2362	0,2402	0,2441	0,2480	0,2520	0,2559	0,2598	0,2638	0,2677	0,2717
7	0,2756	0,2795	0,2835	0,2874	0,2913	0,2953	0,2992	0,3031	0,3071	0,3110
8	0,3150	0,3189	0,3228	0,3268	0,3307	0,3346	0,3386	0,3425	0,3465	0,3504
9	0,3543	0,3583	0,3622	0,2661	0,3701	0,3740	0,3780	0,3819	0,3858	0,3898
10	0,3937	0,3976	0,4016	0,4055	0,4094	0,4134	0,4173	0,4213	0,4252	0,4291

Conversion Tables

Conversion from degrees Celsius (°C) to degrees Fahrenheit (°F)

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
0	32	18	64,4	35	95	52	125,6	69	156,2	86	186,8
1	33,8	19	66,2	36	96,8	53	127,4	70	158	87	188,6
2	35,6	20	68	37	98,6	54	129,2	71	159,8	88	190,4
3	37,4	21	69,8	38	100,4	55	131	72	161,6	89	192,2
4	39,2	22	71,6	39	102,2	56	132,8	73	163,4	90	194
5	41	23	73,4	40	104	57	134,6	74	165,2	91	195,8
6	42,8	24	75,2	41	105,8	58	136,4	75	167	92	197,6
7	44,6	25	77	42	107,6	59	138,2	76	168,8	93	201,2
8	46,4	26	78,8	43	109,4	60	140	77	170,6	94	203
9	48,2	27	80,6	44	111,2	61	141,8	78	172,4	95	204,8
10	50	28	82,4	45	113	62	143,6	79	174,2	96	206,6
11	51,8	29	84,2	46	114,8	63	145,4	80	176	97	208,4
12	53,6	30	86	47	116,6	64	147,2	81	177,8	98	210,2
13	55,4	31	87,8	48	118,4	65	149	82	179,6	99	212
14	57,2	32	89,6	49	120,2	66	150,8	83	181,4	100	–
15	59	33	91,4	50	122	67	152,6	84	183,2	–	–
16	60,8	34	93,2	51	123,8	68	154,4	85	185	–	–
17	62,6	–	–	–	–	–	–	–	–	–	–

Conversion from degrees Celsius (°C) to degrees Kelvin (K)

°C	K	°C	K	°C	K	°C	K	°C	K	°C	K
0	273	18	291	35	308	52	325	69	342	86	359
1	274	19	292	36	309	53	326	70	343	87	360
2	275	20	293	37	310	54	327	71	344	88	361
3	276	21	294	38	311	55	328	72	345	89	362
4	277	22	295	39	312	56	329	73	346	90	363
5	278	23	296	40	313	57	330	74	347	91	364
6	279	24	297	41	314	58	331	75	348	92	365
7	280	25	298	42	315	59	332	76	349	93	366
8	281	26	299	43	316	60	333	77	350	94	367
9	282	27	300	44	317	61	334	78	351	95	368
10	283	28	301	45	318	62	335	79	352	96	369
11	284	29	302	46	319	63	336	80	353	97	370
12	285	30	303	47	320	64	337	81	354	98	371
13	286	31	304	48	321	65	338	82	355	99	372
14	287	32	305	49	322	66	339	83	356	100	373
15	288	33	306	50	323	67	340	84	357	–	–
16	289	34	307	51	324	68	341	85	358	–	–
17	290	–	–	–	–	–	–	–	–	–	–

$$\text{Temp. °C} = \frac{5}{9}\,(\text{t °F} - 32)$$

$$\text{Temp. °F} = \frac{5}{9}\,(\text{t °C} + 32)$$

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Tightening value for bolts according to in-house standard H0385-1
Bolting class II

Bolts and nuts are to be tightened by means of a torque wrench

Shoulder stud with standard metric thread
Friction factor µges. = 0,12

d mm	Strengh class	Bolting class II Tightening torques M A nenn Nm
M4	8,8	2,5
	10,9	3,5
	12,9	4,5
M5	8,8	5,0
	10,9	7,5
	12,9	8,5
M6	8,8	8,5
	10,9	13
	12,9	13
M7	8,8	14
	10,9	20
	12,9	24
M8	8,8	20
	10,9	30
	12,9	36
M10	8,8	42
	10,9	60
	12,9	70
M12	8,8	70
	10,9	110
	12,9	120
M14	8,8	110
	10,9	170
	12,9	200
M16	8,8	180
	10,9	260
	12,9	300
M18	8,8	260
	10,9	360
	12,9	420
M20	8,8	360
	10,9	500
	12,9	600
M22	8,8	480
	10,9	700
	12,9	800
M24	8,8	600
	10,9	850
	12,9	1000
M27	8,8	900
	10,9	1300
	12,9	1500
M30	8,8	1200
	10,9	1700
	12,9	2000

Shoulder stud with metric fine thread
Friction factor µges. = 0,12

d mm	Strengh class	Bolting class II Tightening torques M A nenn Nm
M8 x1	8,8	22
	10,9	34
	12,9	38
M10 x 1,	8,8	46
	10,9	70
	12,9	80
M10 x 1,25	8,8	44
	10,9	65
	12,9	75
M12 x 1,25	8,8	80
	10,9	110
	12,9	140
M12 x 1,5	8,8	75
	10,9	110
	12,9	130
M14 x 1,5	8,8	120
	10,9	180
	12,9	210
M16 x 1,5	8,8	190
	10,9	280
	12,9	320
M18 x 1,5	8,8	280
	10,9	400
	12,9	480
M18 x 2	8,8	260
	10,9	380
	12,9	440
M20 x 1,5	8,8	400
	10,9	550
	12,9	650
M20 x 2	8,8	360
	10,9	550
	12,9	600
M22 x 1,5	8,8	550
	10,9	750
	12,9	850
M22 x 2	8,8	500
	10,9	700
	12,9	850
M24 x 1,5	8,8	700
	10,9	1000
	12,9	1200
M24 x 2	8,8	650
	10,9	950
	12,9	1100
M27 x 2	8,8	650
	10,9	950
	12,9	1100
M30 x 2	8,8	1400
	10,9	1900
	12,9	2300

Lubricants

Solid lubricants

Material specification	Part No.	Operating temperature range in °C	Equivalent manufacturer's
DEUTZ S 1	0134 0198	–180° bis +1400°	Never Seize
DEUTZ S 2	0100 5149	–125° bis +1450°	Molykote Paste G-n Rapid
DEUTZ S 5	0101 6126	–130° bis +1130°	Molykote BR 2

Grease

DEUTZ F 15	0100 9454	–20° bis +140°	Emteka NU 15

Cooling System Protection

5l Container	0101 1490
20l Container	0101 6416
210l Container	1221 1500

Sealants

Material specification	KHD Part-No.	Operating temperature range in °C	Equivalent manufacturer's designation
DEUTZ DW 25	0100 1306	–190° to +250°	Thread tape
DEUTZ DW 30		–190° to +700°	Devametal NiCuFe 10.83/8-3W
DEUTZ DW 40		–190° to +350°	Reinz 4402 Ferrolastic
DEUTZ DW 43	0100 9463	–135° to +100°	Terostat 8585
DEUTZ DW 44	0100 8379	–130° to +150°	Terolan 3531
DEUTZ DW 47	0100 8383	–165° to +230°	Silastic Q3-3305
DEUTZ DW 48	0134 0088	–173° to +230°	Silastic 732 RTV
DEUTZ DW 50	0100 1286	–190° to +110°	Curil Teroson-Fluid
DEUTZ DW 53	0100 8329	–190° to +150°	Sealing compound G
DEUTZ DW 55	0131 9907	–155° to +150°	Loctite Prod.-No. 601
DEUTZ DW 56	0109 8072	–155° to +150°	Loctite Prod.-No. 586
DEUTZ DW 57	0101 6113	–155° to +150°	Loctite Prod.-No. 221
DEUTZ DW 59	0134 0167	–155° to +150°	Loctite Prod.-No. 270
DEUTZ DW 60	0100 1254	–155° to +150°	Loctite Prod.-No. 582
DEUTZ DW 61	0131 9912		Loctite Prod.-No. 747 (activator T)
DEUTZ DW 62	0100 9670	–155° to +200°	Loctite Prod.-No. 640
DEUTZ DW 63	0100 8802	–155° to +150°	Loctite Prod.-No. 573
DEUTZ DW 64	0100 8874	–155° to +150°	Loctite Prod.-No. 275
DEUTZ DW 65	0100 9679	–155° to +120°	Loctite Prod.-No. 638
DEUTZ DW 66	0109 1503	–155° to +150°	Loctite Prod.-No. 570
Sealing Compound	0633 9192		Sikaflex

Adhesives

Material specification	KHD Part No.	Operating temperature range in °C	Equivalent manufacturer's designation
DEUTZ KL 1	0100 1300	–30° to +200°	Gupalon normal
DEUTZ KL 1	0292 5947		Epple adhesive 56
DEUTZ KL 5	0100 8365	–60° to + 80°	Loctite – IS – 414
DEUTZ KL 5A	0100 9331	–60° to + 80°	Loctite – IS – 495
DEUTZ KL 5B	0100 9332	–60° to + 80°	Loctite – IS – 416
DEUTZ KL 8	0131 9914	–30° to +120°	Terostat 58
DEUTZ KL 9	0100 4131	–30° to +120°	Terokal
DEUTZ KL 14	0100 9506	–30° to +200°	Gupalon express

Single-component adhesives

Use of single-component adhesives

For particularly important screwed connections and for snug-fit connections subject to high stress, a single-component adhesive is factory-applied, to guarantee increased protection against loosening and undoing. When the machine is repaired, the parts to be glued together must first be cleaned carefully with commercially available cleaning agents or purified gasoline. The threads or surfaces to be glued must be free of oil and grease and must be dry.

Adhesive application:

For threaded connections, it is sufficient to apply the adhesive to the outside thread.
For tapped blind holes, the adhesive must always be applied to the internal thread, since otherwise the adhesive would be forced out by the air escaping as the part is screwed in.
For snug-fit and joint connections with low play on one part, if there is relatively high play on both parts, apply the adhesive as a closed ring and mount with a gentle rotating movement.

Hardening:

The adhesive takes 6 – 24 hours to harden at a room temperature of 20 °C, which must be maintained constant for the entire hardening period. Since this is not always possible for outside assemblies, we recommend that the relevant site be locally heated by heaters. About 1– 4 hours at 60 °C will be sufficient to harden the adhesive. Do not move the parts. Accelerated hardening is also achieved by pretreatment with an activator. The use of activators reduces the strength of the adhesive, and so if necessary the strongest adhesive should be used. The following table provides a list of adhesives of different makes used in combine harvesters.

KHD Designation	KHD Part No.	Loctite Type	Omnifit Type	Conloc Type	Guidelines for use
DEUTZ DW 55	0100 1251	601	M 150	CL 202	for play of 0.02–0.03, makes threads harder to loosen, secures screws up to M16
DEUTZ DW 56	0109 8072	586 (AVX)	M 80 red	CL 103	for play of 0.02–0.02, makes threads harder to loosen, secures screws up to M20
DEUTZ DW 57	0100 1256	221	L 150 green	CL 051	Improved press-fit 0–0.03, easily loosened, screws up to M14
DEUTZ DW 59	0100 1252	270	M 250 violet	CL 301	for play of 0.02–03, very firm connection, only for large-size threads
DEUTZ DW 60	0100 1254	582 (CVX)	H 150 green	CL 303	for play of 0.03–0.5, extra-firm connection for temperatures up to 100°, only for large-size threads
DEUTZ DW 61	0109 8073	747 (Activator T)	Activator RS US	CL Activator	for faster hardening
	0114 5546	648			high-strength connection for joints shafts hubs

Maintenance and Inspection Schedule for Combine Harvesters

Maintenance and Inspection Schedule for DEUTZ-FAHR Combine Harvesters				for the first time after operating hours			after every operating hours				
	Delivery	daily	yearly	5	20	50	50	100	250	500	1000
To be carried out by authorised DEUTZ-FAHR workshops only	X					X				X	X
1 Engine **Maintenance and inspection according to engine operating instructions**	Oil quality Deutz DQC III-05, ACEA E4-99/E6-04*										
1.1 Check oil level (twice per day during running in phase)	X	X									
1.2 Engine oil change (at least once a year)			X			X			X		
1.3 Replace lube oil filter cartridge						X			X		
1.4 Check coolant level (antifreeze protection)	X	X									
1.5 Change coolant	every two years										
1.6 Retighten engine fastening bolts						X				X	
1.7 Check engine for leak tightness	X			X			X				
1.8 Check, adjust valve clearance (not earlier than 2 hours after engine shutdown)						X				X	
1.9	X					X			X		
1.10 Change fuel filter cartridge						X					X
1.11 Drain fuel tank sump	X		X								
1.12 Drain fuel pre-filter	X					X			X		
1.13 Replace fuel pre-filter, filter cartridge			X								
1.14 Clean air filter cartridge if indicated by warning light											
1.15 Replace air filter cartridge when cleaned five times or when contaminated by soot			X								
1.16 Replace air filter safety cartridge	at least every two years										
1.17 Check air intake and exhaust system for form fit and for leaks	X		X			X			X		
1.18 Check condition of hose sleeves of air ducts and coolant lines and check for leaks	X					X			X		
1.19 Check cooler, clean if necessary: Coolers for engine, charge air, fuel		X									
1.20 Drain condensate at the charge air cooler	X		X								
1.21 Check condition of oil drain hose and check for leaks	X								X		
1.22 Check alarm facilities (air filter, oil pressure, temperature, coolant level)	X		X								
1.23 Check sealing at cooler frame and sieve pan	X								X		
1.24 Clean engine compartment		X									
*Deutz lube oil TLX-10W 40FE Alternatively it is possible to use oils in compliance with the DEUTZ lube oil quality classes DQC III-05, CEA E4-99/E6-04											
2 Drives Check for oil leakage	X	X	Gear oil API-GL 5 (MIL-L-2105 D) SAE 90								
2.1 Shift gear oil change (at least once a year)			X			X				X	
Oil level checking	X								X		
2.2 Check gear shift and adjust if necessary	X					X				X	
2.3 Final drive oil change (at least once a year)			X			X				X	
Oil level checking	X								X		
2.4 Threshing drum reduction gear oil change (at least once a year)			X			X				X	
Oil level checking	X								X		
2.5 Lower angular gear for grain tankoil change (at least once a year)			X			X				X	
Oil level checking	X								X		
2.6 Check V-belt and chain tension and retighten if required	X				X			X			
2.7 Check belt guides and adjust if required	X		X								
3 Hydraulic system	Hydraulic oil HLP 46 DIN 51524 Part 2										
3.1 Check hydraulic oil level	X	X									
3.2 Clean ventilating filter at oil reservoir			X								
3.3 Hydraulic oil change (oil change at least once a year)			X							X	
3.4 Check hydraulic system for leaks	X				X				X		
3.5 Check hydraulic functions	X										
3.6 Check hydrostatic steering system	X										
3.7 Check zero-point setting of hydrostatic ground drive control	X					X				X	
3.8 Replace disposible filter cartridge of hydrostatic ground drive (Hydromat)						X				X	
3.9 Check high pressure hoses at hydrostatic pump and motor for secure mounting	X										
3.10 Clean oil cooler when contaminated											
3.11 Clean or replace line filter of hydrostatic ground drive						X				X	
3.12 Check condition of hydraulic hoses	X		X								
4 Feed passage											
4.1 Check tension of V-belt and feeding chain	X				X			X			
4.2 Check, adjust friction clutch	X		X								
4.3 Check function of electrical reversing device	X		X								
4.4 Check rotating parts for signs of wrapping and remove crop residue		X									
4.5 Check feeding chain, tighten if necessary	X				X		X				
4.6 Check locking device for cutting mechanism	X		X								
4.7 Adapt cutting mechanism to ground with diagonal struts in the feed passage	X										
5 Threshing Mechanism, Cleaning System, Grain Tank											
5.1 Check concave basic setting, threshing drum	X		X			X					
5.2 Check threshing drum speed variator	X									X	
5.3 Check basic setting of turbo separator	X									X	
5.4 Empty stone trap		X									
5.5 Check spray cloth at concave, above straw walkers	X									X	
5.6 Check straw walker shaft speed	X		X								
5.7 Check sieve pan drive and rubber bearings	X					X				X	
5.8 Check straw walkers, sieve securing bolts and seals	X				X				X		

Maintenance and Inspection Schedule for Combine Harvesters

	Maintenance and Inspection Schedule for DEUTZ-FAHR Combine Harvesters	Delivery	daily	yearly	for the first time after operating hours: 5	20	50	after every operating hours: 50	100	250	500	1000
5	**Threshing Mechanism, Cleaning System, Grain Tank**											
5.9	Check grain pan sections for firm fit	X				X				X		
5.10	Check fan variator	X					X				X	
5.11	Check grain elevator chain, tighten if necessary	X				X			X			
5.12	Check grain tank tube lock	X		X								
5.13	Check, adjust friction clutch	X		X								
5.14	Check grain tank and unloading system for leaks	X		X								
5.15	Remove accumulations of crop residuals: Concave, threshing drum, grain pan, under-walker return floor, augers, hollow space above fan		X									
5.16	Check inspection and service flaps for tightness and proper closed locks.	X	X									
6	**Wheels and Brakes**											
6.1	Check service brake, free movement of brake pads	X		X			X				X	
6.2	Check brake fluid level	X					X			X		
6.3	Replace brake fluid	every two years										
6.4	Check parking brake, readjust if necessary	X					X			X		
6.5	Retighten screwed connections: Shift gear, final drive, chassis to axle	X				X						
6.6	Retighten wheel nuts to specified torqueDrive wheels 750 Nm Rear wheels310 Nm	X			X	X	X					
6.7	Check screw connections on the adjustable steering axle to specifications, retighten 410 Nm	X				X						
6.8	Check toe-in of the rear wheels, adjust if necessary	X								X		
6.9	Check bearing play of the rear wheels, readjust	X				X				X		
6.10	Check tyre pressure	X	X									
7	**Lubrication (see Lubrication Schedule)** Thoroughly clean points of lubrication prior to greasing											
7.1	Check for grease escape at points of lubrication (hose connection, condition of lubrication hoses)	X						X				
7.2	Check for grease escape at relief pressure valve with centralised lubrication system		X									
8	**Electrical System**											
8.1	Check lighting equipment	X		X								
8.2	Check adjustment of headlights	X		X								
8.3	Check electrical system	X		X								
8.4	Check wiring harness and plugs for pinches or damage			X								
8.5	Check battery fastening, terminals	X				X				X		
8.6	Check battery electrolyte level and density of acid	X		X						X		
8.7	Check warning devices	X		X								
8.8	Check electrical adjustment of concave and turbo separator, calibrate with Com. Control if necessary	X		X								
8.9	Check on-board computer, grain loss monitoring system	X		X								
8.10	Clean grain loss sensors when contaminated											
8.11	Calibrate electronic cutting mechanism control (EMR-D) with each change of front attachment	X										
8.12	Check Balance control, recalibrate if necessary	X		X								
9	**Cabin, Compressor Cooling System, Cabin Heating**											
9.1	Check sealing of fresh air filters	X		X								
9.2	Clean fresh air filter and recirculating air filter (replace if required)		X									
9.3	Check correct functioning of compressor cooling system	X		X								
9.4	Retighten V-belt for air conditioning compressor	X				X				X		
9.5	Check correct coolant filling level, check for leaks	X		X								
9.6	Clean evaporator, condenser when contaminated											
9.7	Replace fluid container when humidity indicator changes its colour											
9.8	Check cabin heating for proper functioning and for leaks	X		X								
10	**Cutting Mechanism, Trailer, Front Attachment for Rape**											
10.1	Check tension of V-belt and chains	X				X			X			
10.2	Check friction clutches	X		X								
10.3	Check settings of intake auger	X		X								
10.4	Check proper functioning of reel hydraulics	X										
10.5	Check knife gear (head bearing)	X		X		X						
10.6	Check knife guide for wear									X		
10.7	Check sensing skids for free movement, remove contamination		X									
10.8	Retighten trailer wheel bolts, wheel nuts	X			X	X	X					
10.9	Check oil level of front attachment for rape	X						X		X		
10.10	Change hydraulic oil, replace return filter			X			X				X	
11	**Cutting Mechanism with Trailer, Front Attachments for Special Crops, Maize Header, Straw Chopper, Chaff Spreader etc.**	All maintenance and inspection operations must comply with the individual operating instructions										
12	**Accident Prevention Regulations**											
12.1	Inform operators about compliance with legal requirements (see operating instructions)	X										
12.2	Check protective and locking devices	X		X								
12.3	Let fire extinguishers be checked for proper functioning	every two years										
12.4	Components made by other manufacturers may only be installed with the written consent of SAME DEUTZ-FAHR											

5650H, 5660HTS, 5680H, 5690HTS
Operating fluids, filling levels[1] and oil grades

Designation	5650H 5660HTS	5680H 5690HTS	Level Inspection[2]	Change Interval[3]	operating media Specifications
Fuel tank	ca.555 l	ca.555 l	daily		Diesel fuel, sulphur content below 0,5 %
DEUTZ-engine incl. filter change	20,0 l 21,0 l	20,0 l 21,0 l	10 h	50 h then every 250 h	DEUTZ lube oil TLX-10W 40FE, or oils according to Deutz quality class DQC III-05 (ACEA E4-99/E6-04)[4]
Cooling System	55.0 l	55.0 l	daily	2000 h or every two years	Deutz Cooling System Protection Agent Ordering no. 01011490 (5l)
Shift gear	17,0 l	17,0 l	250 h	50 h then every 500 h	Gear oil API-GL 5 (MIL-L 2105 D) SAE 90
Final drive	10,0 l	10,0 l	250 h	50 h then every 500 h	Gear oil API-GL 5 (MIL-L 2105 D) SAE 90
Hydraulic System[4]	65 l	65 l	daily	50h then every 500 h	Hydraulic oil DIN 51524 part 2 HLP 46 (ISO)
Front attachment for rape	6 l	6 l	50 h	50 h then every 500 h	Hydraulic oil DIN 51524 part 2 HLP 46 (ISO)
Hydraulic brake system	0,3 l	0,3 l	100 h	every two years	Brake fluid DOT 4 yellow / DOT 3 or SAE J 1703
Threshing drum-Reduction gear	1.0 l	1.0 l	250 h	50 then every 500 h	Gear oil API-GL 5 (MIL-L 2105 D) SAE 90
Air conditioning system[5] Compressor	2,0 kg 207 cm^3	2,0 kg 207 cm^3	annualy		Coolant R134a Refrigerant oil SP20 for R134a
Lower angular gear at grain tank tube	0,75 l	0,75 l	250 h	50 then every 500 h	Gear oil API-GL 5 (MIL-L 2105 D) SAE 90
Gear chaff spreader	0,4	0,4 l		50 then every 500 h	Gear oil API-GL 5 (MIL-L 2105 D) SAE 90
Chains, joints	as required	as required			SAE EP multi-purpose grease NLGI2

1) The specified filling quantity is a recommended value. The corresponding control facilities shall be definitive.
2) Daily visual inspection for oil leaks
3) Oil change at least once a year.
4) In case of high ambient temperatures oils of higher viscosity can be used.
5) Works at the compressor cooling system must only be performed by a specialised work shop.

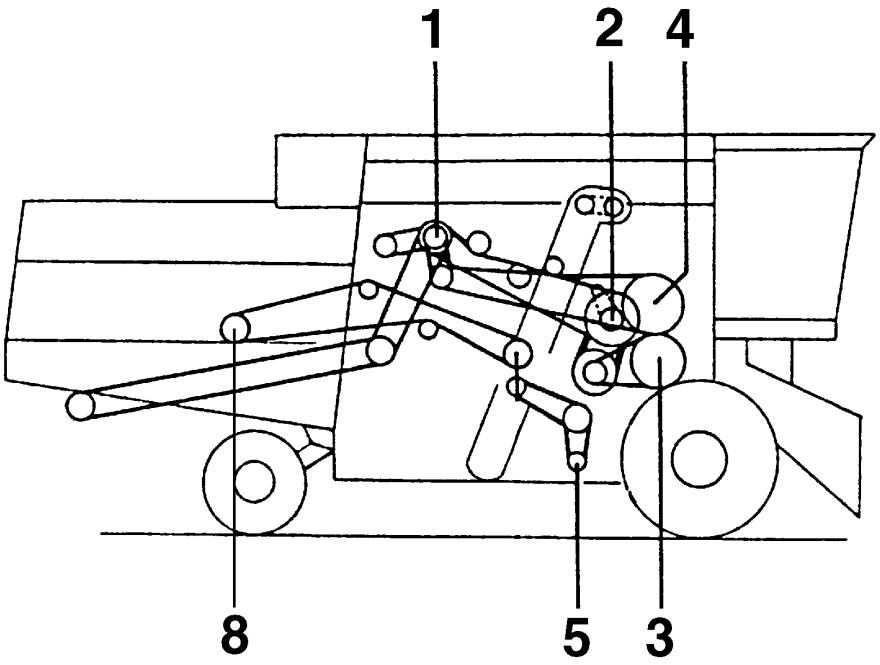
Release list DEUTZ lube oil quality stage DQC III-05

Manufacturer	Lubricant type	SAE class	Availability
DEUTZ	**DEUTZ OIL TLX-10W40FE**	**10W-40**	**Europe**
ADDINOL	ADDINOL Super Truck MD 1048	10W-40	Europe, Asia
	ADDINOL Ultra Truck MD 0538	5W-30	Europe, Asia
AGIP	Agip Sigma Ultra TFE	10W-40	worldwide
	Autol Valve Ultra FE	10W-40	Germany
Akros	Akros Synth. Gold	10W-40	Europe
ARAL	Aral MegaTurboral	10W-40	worldwide
	Aral SuperTurboral	5W-30	worldwide
AVIA	TURBOSYNTH HT-E	10W-40	Germany
BAYWA	BayWa Super Truck 1040 MC	10W-40	South Germany
	BayWa Turbo 4000	10W-40	South Germany
BP OIL International	BP Vanellus E7 Plus	10W-40	Europe
	BP Vanellus E7 Supreme	10W-40	Europe
	BP Vanellus C8 Ultima	5W-30	Europe
Castrol	Castrol Enduron Plus	5W-40	Europe, America,
	Castrol Enduron	10W-40	Australie, Afrique du Sud Europe, Amérique,
	Castrol Elexion	5W-30	Australia, South Africa USA
CEPSA	EUROTRANS SHPD	10W-40	Spain, Portugal
CHEVRON	Chevron Delo 400 Synthtic	5W-40	North America
DEA	DEA Cronos Synth	5W-30	Germany, Europe
	DEA Cronos Premium LD	10W-40	Germany, Europe
	DEA Cronos Premium FX	10W-40	Europe
ESSO	Essolube XTS 501	10W-40	Europe
FUCHS EUROPE	Fuchs Titan Cargo MC	10W-40	worldwide
	Fuchs Titan Unic Plus MC	10W-40	worldwide
MOBIL OIL	Mobil Delvac 1 SHC	5W-40	Europe, SE Asia, -
			Africa
	Mobil Delvac 1	5W-40	worldwide
	Mobil Delvac XHP Extra	10W-40	Europe, SE Asia
OMV AG	OMV super Truck	5W-30	Europe
	OMC truck FE plus	10W-40	Europe
Ravensberger Schmierölvertrieb	Ravenol Performance Truck	10W-40	Germany
Lube oil refinery Salzbergen	Wintershall TFG	10W-40	Europe
Shell International	Shell Myrina TX/Shell Rimula Ultra	5W-30	Europe, designation varies nationally
	Shell Myrina TX/Shell Rimula Ul-tra	10W-40	Europe, designation varies nationally
Texaco	Ursa Super TDX10W-40	10W-40	Europe
	Ursa Premium FE 5W-30	5W-30	Europe
TOTAL	TOTAL RUBIA TIR 8600	10W-40	worldwide
	EXPERTY	10W-40	worldwide

5650H – 5690HTS
Speeds

Combine Harvester			5670	5680 5690 -12225	5650, 5660 5680, 5690 + 12226
1	Engine with threshing mechanism disengaged	1/min	2610 – 2655	2425 ±15	2390 ±15
1	Engine with threshing mechanism engaged	1/min	2590 – 2635	2415 ±15	2385 ±15
2	Straw stripper drum 1)	1/min	930 +25/–40	945 +25/–40	945 +25/–40
3	Threshing drum	1/min	400 – 1250 ±50	405 – 1265 ±50	405 – 1265 ±50
4	Grain tank discharge	1/min	560 ±40	530 ±40	530 ±40
5	Fan	1/min	400 – 900 +50/–30	410 – 950 +50/–30	410 – 950 +50/–30
6	Sieve box	1/min	285 +15	301 ±5	301 ±5
7	Returns elevator – grain Returns elevator – maize	1/min 1/min	1110 ±30 795 ±20	1170 ±30 850 ±20	1170 ±30 850 ±20
8	Straw walkers – grain Straw walkers – rice	1/min 1/min	201 +5 210 +5/ –6	206 ±2 213 ±2	206 ±2 213 ±2
9	Feed passage shaft, top	1/min	425 +/ –2	430 ±20	430 ±20
10	Turbo Separator Grain Turbo Separator Maize	1/min 1/min	790 ±20 380 ±30	805 +30/ –20 390 ±30	805 +30/ –20 390 ±30

1) As of year of manufacture 2007 the straw stripper drum is driven by the threshing drum.



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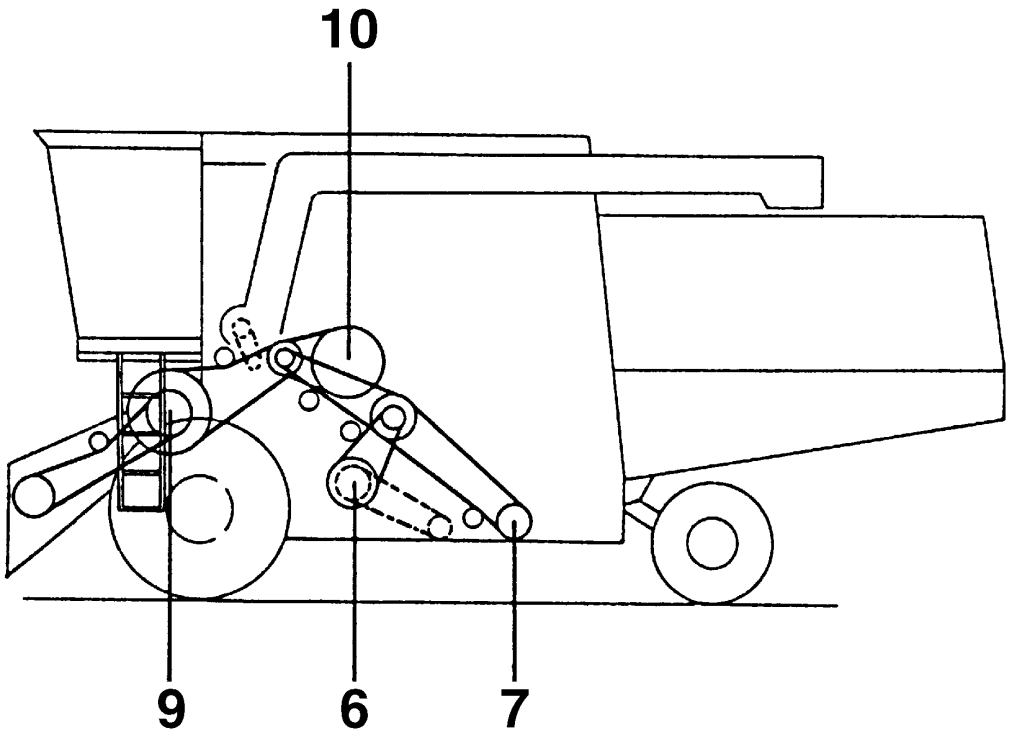

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5650H – 5690HTS
Tightening values of adapter bearings

Bearing point	Bearing	Tightening torque
Threshing drum/turbo separator	Grooved ball bearing	140 Nm
Straw stripper drum left side	Grooved ball bearing	140 Nm
Straw stripper drum right side	Ball joint bearing	180 Nm
Straw walker bearing	Grooved ball bearing	Pretensioning torque 50 Nm + Swivelling angle 180°
Shaft of sieve box drive	Swivel-joint roller bearing	100 $^{+20}$ Nm
Countershaft inside of feed passage	Swivel-joint roller bearing	56 Nm