

Shop Manual

Part I

WA470-5H

WA480-5H

WHEEL LOADER

MODEL

WA470-5H

WA480-5H

SERIAL NUMBER

WA470H50051 AND UP

WA480H50051 AND UP

- This shop manual may contain attachments and optional equipment that are not available in your area. Please consult your local KOMATSU distributor for those items you may require. Materials and specifications are subject to change without notice.
- WA470-5 and WA480-5 mount the SAA6D125-3 engine.
For details of the engine, see the 125-3 Series Engine Shop Manual

Product: KOMATSU WA470-5H,WA480-5H Wheel Loader Service Repair Workshop Manual
Full Download: <https://www.arepairmanual.com/downloads/komatsu-wa470-5hwa480-5h-wheel-loader-service-repair-workshop-manual/>

Sample of manual. Download All 1302 pages at:
<https://www.arepairmanual.com/downloads/komatsu-wa470-5hwa480-5h-wheel-loader-service-repair-workshop-manual/>

CONTENTS

No. of page

00 SAFETY	SHOP MANUAL: PART I	00-3
01 GENERAL	SHOP MANUAL: PART I	01-1
10 STRUCTURE AND FUNCTION	SHOP MANUAL: PART I	10-1
20 TESTING AND ADJUSTING	SHOP MANUAL: PART I	20-1
30 DISASSEMBLY AND ASSEMBLY	SHOP MANUAL: PART II	30-1
90 APPENDIX	SHOP MANUAL: PART II	90-1

SUPPLEMENT

The affected pages are indicated by the use of the following marks.

It is requested that necessary actions must be taken to these pages according to the list below.

Pages having no marks are not revised at this time.

Mark	Indication	Action Required
○	New page to be added	Add
●	Page to be replaced	Replace
()	Page to be deleted	Discard

Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number
●	Title-1	①		01-7			10-37			10-77	
●	Title-2	①		01-8			10-38			10-78	
●	TOC-1	①		01-9			10-39			10-79	
●	TOC-2	①		01-10			10-40			10-80	
○	TOC-2.1	①		10-1			10-41			10-81	
○	TOC-2.2	①		10-2			10-42			10-82	
○	TOC-2.3	①		10-3			10-43			10-83	
○	TOC-2.4	①		10-4			10-44			10-84	
○	TOC-2.5	①		10-5			10-45			10-85	
○	TOC-2.6	①		10-6			10-46			10-86	
○	TOC-2.7	①		10-7			10-47			10-87	
○	TOC-2.8	①		10-8			10-48			10-88	
	00-1			10-9			10-49			10-89	
	00-2			10-10			10-50			10-90	
	00-3			10-11			10-51			10-91	
	00-4			10-12			10-52			10-92	
	00-5			10-13			10-53			10-93	
	00-6			10-14			10-54			10-94	
	00-7			10-15			10-55			10-95	
	00-8			10-16			10-56			10-96	
	00-9			10-17			10-57			10-97	
	00-10			10-18			10-58			10-98	
	00-11			10-19			10-59			10-99	
	00-12			10-20			10-60			10-100	
	00-13			10-21			10-61			10-101	
	00-14			10-22			10-62			10-102	
	00-15			10-23			10-63			10-103	
	00-16			10-24			10-64			10-104	
	00-17			10-25			10-65			10-105	
	00-18			10-26			10-66			10-106	
	00-19			10-27			10-67			10-107	
	00-20			10-28			10-68			10-108	
	00-21			10-29			10-69			10-109	
	00-22			10-30			10-70			10-110	
	01-1			10-31			10-71		●	10-111	①
	01-2			10-32			10-72		●	10-112	①
	01-3			10-33			10-73			10-113	
	01-4			10-34			10-74			10-114	
	01-5			10-35			10-75			10-115	
	01-6			10-36			10-76			10-116	

Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number
	10-117			10-165			10-212			10-260	
	10-118			10-166			10-213			10-261	
	10-119			10-167			10-214			10-262	
	10-120			10-168			10-215			10-263	
	10-121			10-169			10-216			10-264	
	10-122			10-170			10-217			10-265	
	10-123			10-171			10-218			10-266	
	10-124			10-172			10-219			10-267	
	10-125			10-173			10-220			10-268	
	10-126			10-174			10-221			10-269	
	10-127			10-175			10-222			10-270	
	10-128			10-176			10-223			10-271	
	10-129			10-177			10-224			10-272	
	10-130			10-178			10-225			10-273	
	10-131			10-179			10-226			10-274	
	10-132			10-180			10-227			10-275	
	10-133			10-181			10-228			10-276	
	10-134			10-182			10-229			10-277	
	10-135			10-183			10-230			10-278	
	10-136			10-184			10-231			10-279	
	10-137		●	10-185	①		10-232			10-280	
	10-138		●	10-186	①		10-233			10-281	
	10-139			10-187			10-234			10-282	
	10-140			10-188			10-235			10-283	
	10-141			10-188			10-236			10-284	
	10-142		●	10-189	①		10-237			10-285	
	10-143		●	10-190	①		10-238			10-286	
	10-144			10-191			10-239			10-287	
	10-145			10-192			10-240			10-288	
	10-146			10-193			10-241			10-289	
	10-147			10-194			10-242			10-290	
	10-148			10-195			10-243			10-291	
	10-149			10-196			10-244			10-292	
	10-150			10-197			10-245			10-293	
	10-151			10-198			10-246			10-294	
	10-152			10-199			10-247			10-295	
	10-153			10-200			10-248			10-296	
	10-154			10-201			10-249			10-297	
	10-155			10-202			10-250			10-298	
	10-156			10-203			10-251			10-299	
	10-157			10-204			10-252			10-300	
	10-158			10-205			10-253			10-301	
	10-159			10-206			10-254			10-302	
	10-160			10-207			10-255			10-303	
	10-161			10-208			10-256			10-304	
	10-162			10-209			10-257			10-305	
	10-163			10-210			10-258			10-306	
	10-164			10-211			10-259		●	10-307	①

Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number
●	10-308	①		10-356			20-128			20-222	
	10-309			10-357			20-129			20-223	
	10-310			10-358			20-130			20-224	
	10-311			10-359			20-131			20-225	
	10-312			10-360			20-132			20-226	
	10-313			10-361			20-133			20-227	
	10-314			10-362			20-134			20-228	
	10-315			10-363			20-135			20-229	
	10-316			10-364			20-136			20-230	
	10-317			10-365			20-137			20-231	
	10-318			10-366			20-138			20-232	
	10-319			20-1			20-139			20-233	
	10-320			20-2			20-140			20-234	
●	10-321	①		20-3			20-141			20-235	
●	10-322	①		20-4			20-142			20-236	
	10-323			20-5			20-143			20-237	
	10-324			20-6			20-144			20-238	
	10-325			20-7			20-145			20-239	
	10-326			20-8			20-146			20-240	
	10-327			20-9			20-147			20-241	
	10-328			20-10			20-148			20-242	
	10-329			20-101			20-149			20-243	
	10-330			20-102			20-150			20-244	
	10-331			20-103			20-151			20-245	
	10-332			20-104			20-152			20-246	
	10-333			20-105			20-153			20-247	
	10-334			20-106			20-154			20-248	
	10-335			20-107			20-201			20-249	
	10-336			20-108			20-202			20-250	
●	10-337	①		20-109			20-203			20-251	
●	10-338	①		20-110			20-204			20-252	
●	10-339	①		20-111			20-205			20-253	
●	10-340	①		20-112			20-206			20-254	
	10-341			20-113			20-207			20-255	
	10-342			20-114			20-208			20-256	
	10-343			20-115			20-209			20-257	
	10-344			20-116			20-210			20-258	
	10-345			20-117			20-211			20-259	
	10-346			20-118			20-212			20-260	
	10-347			20-119			20-213			20-261	
	10-348			20-120			20-214			20-262	
	10-349			20-121			20-215			20-263	
	10-350			20-122			20-216			20-264	
	10-351			20-123			20-217			20-265	
	10-352			20-124			20-218			20-266	
	10-353			20-125			20-219			20-267	
	10-354			20-126			20-220			20-268	
	10-355			20-127			20-221		●	20-301	①

Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number
●	20-302	①	●	20-350	①	●	20-430	①	●	20-478	①
●	20-303	①	●	20-351	①	●	20-431	①	●	20-479	①
●	20-304	①	●	20-352	①	●	20-432	①	●	20-480	①
●	20-305	①	●	20-353	①	●	20-433	①	●	20-481	①
●	20-306	①	●	20-354	①	●	20-434	①	●	20-482	①
●	20-307	①	●	20-355	①	●	20-435	①	●	20-483	①
●	20-308	①	●	20-356	①	●	20-436	①	●	20-484	①
●	20-309	①	●	20-357	①	●	20-437	①	●	20-485	①
●	20-310	①	●	20-358	①	●	20-438	①	●	20-486	①
●	20-311	①	●	20-359	①	●	20-439	①	●	20-487	①
●	20-312	①	●	20-360	①	●	20-440	①	●	20-488	①
●	20-313	①	●	20-361	①	●	20-441	①	●	20-489	①
●	20-314	①	●	20-362	①	●	20-442	①	●	20-490	①
●	20-315	①	●	20-363	①	●	20-443	①	●	20-491	①
●	20-316	①	●	20-364	①	●	20-444	①	●	20-492	①
●	20-317	①	●	20-365	①	●	20-445	①	●	20-493	①
●	20-318	①	●	20-366	①	●	20-446	①	●	20-494	①
●	20-319	①	●	20-367	①	●	20-447	①	●	20-495	①
●	20-320	①	●	20-368	①	●	20-448	①	●	20-496	①
●	20-321	①	●	20-401	①	●	20-449	①	●	20-497	①
●	20-322	①	●	20-402	①	●	20-450	①	●	20-498	①
●	20-323	①	●	20-403	①	●	20-451	①	●	20-499	①
●	20-324	①	●	20-404	①	●	20-452	①	●	20-490	①
●	20-325	①	●	20-405	①	●	20-453	①	●	20-501	①
●	20-326	①	●	20-406	①	●	20-454	①	●	20-502	①
●	20-327	①	●	20-407	①	●	20-455	①	●	20-503	①
●	20-328	①	●	20-408	①	●	20-456	①	●	20-504	①
●	20-329	①	●	20-409	①	●	20-457	①	●	20-505	①
●	20-330	①	●	20-410	①	●	20-458	①	●	20-506	①
●	20-331	①	●	20-411	①	●	20-459	①	●	20-507	①
●	20-332	①	●	20-412	①	●	20-460	①	●	20-508	①
●	20-333	①	●	20-413	①	●	20-461	①	●	20-509	①
●	20-334	①	●	20-414	①	●	20-462	①	●	20-510	①
●	20-335	①	●	20-415	①	●	20-463	①	●	20-511	①
●	20-336	①	●	20-416	①	●	20-464	①	●	20-512	①
●	20-337	①	●	20-417	①	●	20-465	①	●	20-513	①
●	20-338	①	●	20-418	①	●	20-466	①	●	20-514	①
●	20-339	①	●	20-419	①	●	20-467	①	●	20-515	①
●	20-340	①	●	20-420	①	●	20-468	①	●	20-516	①
●	20-341	①	●	20-421	①	●	20-469	①	●	20-517	①
●	20-342	①	●	20-422	①	●	20-470	①	●	20-518	①
●	20-343	①	●	20-423	①	●	20-471	①	●	20-519	①
●	20-344	①	●	20-424	①	●	20-472	①	●	20-520	①
●	20-345	①	●	20-425	①	●	20-473	①	●	20-521	①
●	20-346	①	●	20-426	①	●	20-474	①	●	20-522	①
●	20-347	①	●	20-427	①	●	20-475	①	●	20-523	①
●	20-348	①	●	20-428	①	●	20-476	①	●	20-524	①
●	20-349	①	●	20-429	①	●	20-477	①	●	20-525	①

Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number
●	20-526	①	●	20-630	①	●	20-678	①	●	20-806	①
●	20-527	①	●	20-631	①	●	20-679	①	●	20-807	①
●	20-528	①	●	20-632	①	●	20-680	①	●	20-808	①
●	20-529	①	●	20-633	①	●	20-681	①	●	20-809	①
●	20-530	①	●	20-634	①	●	20-682	①	●	20-810	①
●	20-531	①	●	20-635	①	●	20-683	①	●	20-811	①
●	20-532	①	●	20-636	①	●	20-684	①	●	20-812	①
●	20-533	①	●	20-637	①	●	20-685	①	●	20-813	①
●	20-534	①	●	20-638	①	●	20-686	①	●	20-814	①
●	20-535	①	●	20-639	①	●	20-687	①	●	20-815	①
●	20-536	①	●	20-640	①	●	20-688	①	●	20-816	①
●	20-537	①	●	20-641	①	●	20-689	①	●	20-817	①
●	20-538	①	●	20-642	①	●	20-690	①	●	20-818	①
●	20-539	①	●	20-643	①	●	20-691	①	●	20-819	①
●	20-540	①	●	20-644	①	●	20-692	①	●	20-820	①
●	20-541	①	●	20-645	①	●	20-693	①	●	20-821	①
●	20-542	①	●	20-646	①	●	20-694	①	●	20-822	①
●	20-543	①	●	20-647	①	●	20-695	①	●	20-823	①
●	20-544	①	●	20-648	①	●	20-696	①	●	20-824	①
●	20-601	①	●	20-649	①	●	20-697	①	●	20-825	①
●	20-602	①	●	20-650	①	●	20-698	①	●	20-826	①
●	20-603	①	●	20-651	①	●	20-699	①	●	20-827	①
●	20-604	①	●	20-652	①	●	20-700	①	●	20-828	①
●	20-605	①	●	20-653	①	●	20-701	①	●	20-829	①
●	20-606	①	●	20-654	①	●	20-702	①	●	20-830	①
●	20-607	①	●	20-655	①	●	20-703	①	●	20-831	①
●	20-608	①	●	20-656	①	●	20-704	①	●	20-832	①
●	20-609	①	●	20-657	①	●	20-705	①	●	20-833	①
●	20-610	①	●	20-658	①	●	20-706	①	●	20-834	①
●	20-611	①	●	20-659	①	●	20-707	①	●	20-835	①
●	20-612	①	●	20-660	①	●	20-708	①	●	20-836	①
●	20-613	①	●	20-661	①	●	20-709	①	●	20-837	①
●	20-614	①	●	20-662	①	●	20-710	①	●	20-838	①
●	20-615	①	●	20-663	①	●	20-711	①	●	20-839	①
●	20-616	①	●	20-664	①	●	20-712	①	●	20-840	①
●	20-617	①	●	20-665	①	●	20-713	①	●	20-841	①
●	20-618	①	●	20-666	①	●	20-714	①	●	20-842	①
●	20-619	①	●	20-667	①	●	20-715	①	●	20-843	①
●	20-620	①	●	20-668	①	●	20-716	①	●	20-844	①
●	20-621	①	●	20-669	①	●	20-717	①	●	20-845	①
●	20-622	①	●	20-670	①	●	20-718	①	●	20-846	①
●	20-623	①	●	20-671	①	●	20-719	①	●	20-847	①
●	20-624	①	●	20-672	①	●	20-720	①	●	20-848	①
●	20-625	①	●	20-673	①	●	20-801	①	●	20-849	①
●	20-626	①	●	20-674	①	●	20-802	①	●	20-850	①
●	20-627	①	●	20-675	①	●	20-803	①	●	20-851	①
●	20-628	①	●	20-676	①	●	20-804	①	●	20-852	①
●	20-629	①	●	20-677	①	●	20-805	①	●	20-853	①

Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number
●	20-854	①	●	20-910	①	●	20-1030	①		30-30	
●	20-855	①	●	20-911	①	●	20-1031	①		30-31	
●	20-856	①	●	20-912	①	●	20-1032	①		30-32	
●	20-857	①	●	20-913	①	●	20-1033	①		30-33	
●	20-858	①	●	20-914	①	●	20-1034	①		30-34	
●	20-859	①	●	20-915	①	●	20-1035	①		30-35	
●	20-860	①	●	20-916	①	●	20-1036	①		30-36	
●	20-861	①	●	20-917	①	●	20-1037	①		30-37	
●	20-862	①	●	20-918	①	●	20-1038	①		30-38	
●	20-863	①	●	20-919	①	●	20-1039	①		30-39	
●	20-864	①	●	20-920	①	●	20-1040	①		30-40	
●	20-865	①	●	20-921	①	●	20-1041	①		30-41	
●	20-866	①	●	20-922	①	●	20-1042	①		30-42	
●	20-867	①	●	20-923	①	●	20-1043	①		30-43	
●	20-868	①	●	20-924	①	●	20-1044	①		30-44	
●	20-869	①	●	20-925	①	●	Title-1	①		30-45	
●	20-870	①	●	20-926	①	●	Title-2	①		30-46	
●	20-871	①	●	20-927	①		TOC-1			30-47	
●	20-872	①	●	20-928	①		TOC-2			30-48	
●	20-873	①	●	20-1001	①		30-1			30-49	
●	20-874	①	●	20-1002	①		30-2			30-50	
●	20-875	①	●	20-1003	①		30-3			30-51	
●	20-876	①	●	20-1004	①		30-4			30-52	
●	20-877	①	●	20-1005	①		30-5			30-53	
●	20-878	①	●	20-1006	①		30-6			30-54	
●	20-879	①	●	20-1007	①		30-7			30-55	
●	20-880	①	●	20-1008	①		30-8			30-56	
●	20-881	①	●	20-1009	①		30-9			30-57	
●	20-882	①	●	20-1010	①		30-10			30-58	
●	20-883	①	●	20-1011	①		30-11			30-59	
●	20-884	①	●	20-1012	①		30-12			30-60	
●	20-885	①	●	20-1013	①		30-13			30-61	
●	20-886	①	●	20-1014	①		30-14			30-62	
●	20-887	①	●	20-1015	①		30-15			30-63	
●	20-888	①	●	20-1016	①		30-16			30-64	
●	20-889	①	●	20-1017	①		30-17			30-65	
●	20-890	①	●	20-1018	①		30-18			30-66	
●	20-891	①	●	20-1019	①		30-19			30-67	
●	20-892	①	●	20-1020	①		30-20			30-68	
●	20-901	①	●	20-1021	①		30-21			30-69	
●	20-902	①	●	20-1022	①		30-22			30-70	
●	20-903	①	●	20-1023	①		30-23			30-71	
●	20-904	①	●	20-1024	①		30-24			30-72	
●	20-905	①	●	20-1025	①		30-25			30-73	
●	20-906	①	●	20-1026	①		30-26			30-74	
●	20-907	①	●	20-1027	①		30-27			30-75	
●	20-908	①	●	20-1028	①		30-28			30-76	
●	20-909	①	●	20-1029	①		30-29			30-77	

Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number	Mark	Page	Revision-number
	30-78			30-126			30-174			30-222	
	30-79			30-127			30-175			30-223	
	30-80			30-128			30-176			30-224	
	30-81			30-129			30-177		●	90-1	①
	30-82			30-130			30-178		●	90-2	①
	30-83			30-131			30-179		●	90-3	①
	30-84			30-132			30-180		○	90-3.1	①
	30-85			30-133			30-181		○	90-3.2	①
	30-86			30-134			30-182		●	90-4	①
	30-87			30-135			30-183		●	90-5	①
	30-88			30-136			30-184		●	90-6	①
	30-89			30-137			30-185		●	90-7	①
	30-90			30-138			30-186		○	90-7.1	①
	30-91			30-139			30-187		○	90-7.2	①
	30-92			30-140			30-188		○	90-8	①
	30-93			30-141			30-189			90-9	
	30-94			30-142			30-190			90-11	
	30-95			30-143			30-191			90-13	
	30-96			30-144			30-192			90-15	
	30-97			30-145			30-193			90-17	
	30-98			30-146			30-194			90-19	
	30-99			30-147			30-195			90-21	
	30-100			30-148			30-196			90-23	
	30-101			30-149			30-197			90-25	
	30-102			30-150			30-198			90-27	
	30-103			30-151			30-199			90-29	
	30-104			30-152			30-200			90-31	
	30-105			30-153			30-201			90-33	
	30-106			30-154			30-202			90-35	
	30-107			30-155			30-203		○	90-37	①
	30-108			30-156			30-204		○	90-39	①
	30-109			30-157			30-205		○	90-41	①
	30-110			30-158			30-206		○	90-43	①
	30-111			30-159			30-207		○	90-45	①
	30-112			30-160			30-208		○	90-47	①
	30-113			30-161			30-209		○	90-49	①
	30-114			30-162			30-210		○	90-51	①
	30-115			30-163			30-211				
	30-116			30-164			30-212				
	30-117			30-165			30-213				
	30-118			30-166			30-214				
	30-119			30-167			30-215				
	30-120			30-168			30-216				
	30-121		●	30-169	①		30-217				
	30-122		●	30-170	①		30-218				
	30-123			30-171			30-219				
	30-124			30-172			30-220				
	30-125			30-173			30-221				

Blank for technical reason

00 SAFETY

Safety	00-2
Safety notice	00-2
General precautions	00-2
Preparations for work	00-3
Precautions during work	00-3
General	00-5
How to read the shop manual	00-6
Volumes	00-6
Filing method	00-6
Revised edition mark	00-6
Revisions	00-6
Symbols	00-7
Hoisting instructions	00-8
Hoisting	00-8
Coating materials	00-10
Standard tightening torque	00-12
Standard tightening torque of bolts and nuts .	00-12
Tightening torque of hose nuts	00-13
Tightening torque of split flange bolts	00-13
Tightening torque for flared nuts	00-13
Tightening torque for 102 engine series (bolts and nuts)	00-14
Tightening torque for 102 engine series (eye joints)	00-14
Tightening torque for 102 engine series (tapered screws)	00-14
Electric wire code	00-15
Classification by thickness	00-15
Classification by color and code	00-15
Conversion tables	00-16
Method of using the conversion table	00-16
Units	00-22

Safety

Safety notice

IMPORTANT SAFETY NOTICE

Proper service and repair is extremely important for the safe operation of your machine. The service and repair techniques recommended and described in this manual are both effective and safe methods of operation. Some of these operations require the use of tools specially designed for the purpose.

To prevent injury to workers, the symbol  is used to mark safety precautions in this manual. The cautions accompanying these symbols should always be followed carefully. If any dangerous situation arises or may possibly arise, first consider safety, and take the necessary actions to deal with the situation.

General precautions

Mistakes in operation are extremely dangerous. Read the OPERATION & MAINTENANCE MANUAL carefully BEFORE operating the machine.

1. Before carrying out any greasing or repairs, read all the precautions given on the decals which are fixed to the machine.
2. When carrying out any operation, always wear safety shoes and helmet. Do not wear loose work clothes, or clothes with buttons missing.
 - Always wear safety glasses when hitting parts with a hammer.
 - Always wear safety glasses when grinding parts with a grinder, etc.
3. If welding repairs are needed, always have a trained, experienced welder carry out the work. When carrying out welding work, always wear welding gloves, apron, glasses, cap and other clothes suited for welding work.
4. When carrying out any operation with two or more workers, always agree on the operating procedure before starting. Always inform your fellow workers before starting any step of the operation. Before starting work, hang UNDER REPAIR signs on the controls in the operator's compartment.
5. Keep all tools in good condition and learn the correct way to use them.
6. Decide a place in the repair workshop to keep tools and removed parts. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dirt or oil on the floor. Smoke only in the areas provided for smoking. Never smoke while working.

Preparations for work

1. Before adding oil or making repairs, park the machine on hard, level ground, and block the wheels or tracks to prevent the machine from moving.
2. Before starting work, lower blade, ripper, bucket or any other work equipment to the ground. If this is not possible, insert the safety pin or use blocks to prevent the work equipment from falling. In addition, be sure to lock all the control levers and hang warning signs on them.
3. When disassembling or assembling, support the machine with blocks, jacks or stands before starting work.
4. Remove all mud and oil from the steps or other places used to get on and off the machine. Always use the handrails, ladders or steps when getting on or off the machine. Never jump on or off the machine. If it is impossible to use the handrails, ladders or steps, use a stand to provide safe footing.

Precautions during work

1. When removing the oil filler cap, drain plug or hydraulic pressure measuring plugs, loosen them slowly to prevent the oil from spurting out. Before disconnecting or removing components of the oil, water or air circuits, first remove the pressure completely from the circuit.
2. The water and oil in the circuits are hot when the engine is stopped, so be careful not to get burned. Wait for the oil and water to cool before carrying out any work on the oil or water circuits.
3. Before starting work, remove the leads from the battery. ALWAYS remove the lead from the negative (-) terminal first.
4. When raising heavy components, use a hoist or crane. Check that the wire rope, chains and hooks are free from damage. Always use lifting equipment which has ample capacity. Install the lifting equipment at the correct places. Use a hoist or crane and operate slowly to prevent the component from hitting any other part. Do not work with any part still raised by the hoist or crane.
5. When removing covers which are under internal pressure or under pressure from a spring, always leave two bolts in position on opposite sides. Slowly release the pressure, then slowly loosen the bolts to remove.
6. When removing components, be careful not to break or damage the wiring. Damaged wiring may cause electrical fires.
7. When removing piping, stop the fuel or oil from spilling out. If any fuel or oil drips on to the floor, wipe it up immediately. Fuel or oil on the floor can cause you to slip, or can even start fires.

-
8. As a general rule, do not use gasoline to wash parts. In particular, use only the minimum of gasoline when washing electrical parts.
 9. Be sure to assemble all parts again in their original places. Replace any damaged part with new parts.
 - When installing hoses and wires, be sure that they will not be damaged by contact with other parts when the machine is being operated.
 10. When installing high pressure hoses, make sure that they are not twisted. Damaged tubes are dangerous, so be extremely careful when installing tubes for high pressure circuits. Also check that connecting parts are correctly installed.
 11. When assembling or installing parts, always use the specified tightening torques. When installing protective parts such as guards, or parts which vibrate violently or rotate at high speed, be particularly careful to check that they are installed correctly.
 12. When aligning two holes, never insert your fingers or hand. Be careful not to get your fingers caught in a hole.
 13. When measuring hydraulic pressure, check that the measuring tool is correctly assembled before taking any measurements.
 14. Take care when removing or installing the tracks of track-type machines. When removing the track, the track separates suddenly, so never let anyone stand at either end of the track.

General

This shop 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 shop 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. These sections are further divided into each main group of components

General

This section lists the general machine dimensions, performance specifications, component weights, and fuel, coolant and lubricant specification charts.

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.

Testing, Adjusting and Troubleshooting

This section explains checks to be made before and after performing repairs, as well as adjustments to be made at completion of the checks and repairs. Troubleshooting charts correlating "Problems" to "Causes" are also included in this section.

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.

Maintenance Standard

This section gives the judgement standards when inspecting disassembled parts.

NOTE

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

How to read the shop manual

Volumes

Shop manuals are issued as a guide to carrying out repairs. They are divided as follows:

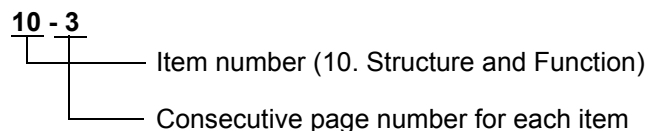
- Chassis volume:** Issued for every machine model
- Engine volume:** Issued for each engine series
- Electrical volume:** Each issued as one to cover all models
- Attachment volume:** Each issued as one to cover all models

These various volumes are designed to avoid duplication of information. Therefore to deal with all repairs for any model, it is start any work.

Filing method

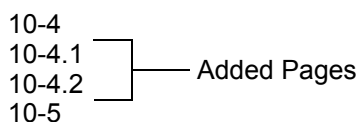
1. See the page number on the bottom of the page. File the pages in correct order.
2. Following examples show how to read the page number.

Example 1 (Chassis volume):



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

Example:



Revised edition mark

When a manual is revised, an edition mark (① ② ③...) is recorded on the bottom of the pages.

Revisions

Revised pages are shown at the LIST OF REVISED PAGES between the title page and SAFETY page.

Symbols

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

Symbol	Item	Remarks
	Safety	Special safety precautions are necessary when performing the work.
	Caution	Special technical precautions or other precautions for preserving standards are necessary when performing the work.
	Weight	Weight of parts of systems. Caution necessary when selecting hoisting wire, or when working posture is important, etc.
	Tightening torque	Places that require special attention for the tightening torque during assembly.
	Coat	Places to be coated with adhesives and lubricants, etc.
	Oil, water	Places where oil, water or fuel must be added, and the capacity.
	Drain	Places where oil or water must be drained, and quantity to be drained.

Hoisting instructions

Hoisting



Heavy parts (25kg or more) must be lifted with a hoist, etc. In the DISASSEMBLY AND ASSEMBLY section, every part weighing 25 kg or more is indicated clearly with the symbol:



If a part cannot be smoothly removed from the machine by hoisting, the following checks should be made:

1. Check for removal of all bolts fastening the part to the relative parts.
2. Check for existence of another part causing interference with the part to be removed.

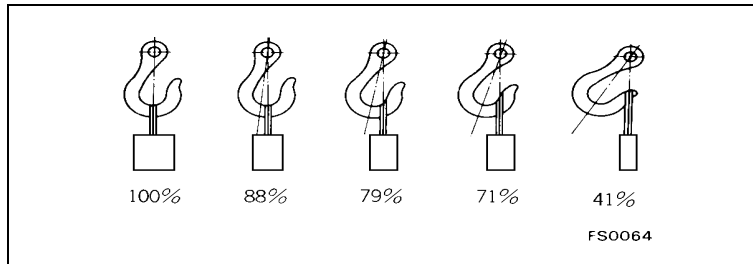
Wire ropes

1. Use adequate ropes depending on the weight of parts to be hoisted, referring to the table below:
 - The allowable load in tons, is given by vertical tensible force.
 - The allowable load value is estimated to be one-sixth or one-seventh of the breaking strength of the rope used.

Wire ropes: (Standard "Z" or "S" twist ropes without galvanizing)	
Rope diameter (mm)	Allowable load (tons)
10	1.0
11.2	1.4
12.5	1.6
14	2.2
16	2.8
18	3.6
20	4.4
22.4	5.6
30	10.0
40	18.0
50	28.0
60	40.0

2. Sling wire ropes from the middle portion of the hook.

Slinging near the edge of the hook may cause the rope to slip off the hook during hoisting, and a serious accident can result. Hooks have maximum strength at the middle portion.



3. Do not sling a heavy load with one rope alone, but sling with two or more ropes symmetrically wound onto the load.



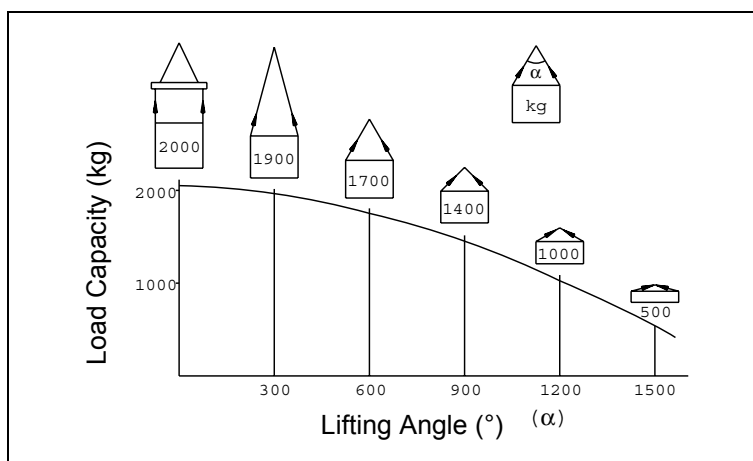
Slinging with one rope may cause turning of the load during hoisting, untwisting of the rope, or slipping of the rope from its original winding position on the load, which can result in a dangerous accident.

4. Do not sling a heavy load with ropes forming a wide hanging angle from the hook.

When hoisting a load with two or more ropes, the force subjected to each rope will increase with the hanging angles.

The table below shows the variation of allowable load (kg) when hoisting is made with two ropes, each of which is allowed to sling up to 1000 kg vertically, at various hanging angles.

When two ropes sling a load vertically, up to 2000 kg of total weight can be suspended. This weight becomes 1000 kg when two ropes make a 120° hanging angle. On the other hand, two ropes are subjected to an excessive force as large as 4000 kg if they sling a 2000 kg load at a lifting angle of 150°.



Coating materials

The recommended coating materials prescribed in the shop manuals are listed below.

Category	Code	Part No.	Quantity	Container	Main applications, features
Adhesives	LT-1A	790-129-9030	150 g	Tube	Used to prevent rubber gaskets, rubber cushions and cork plugs from coming out
	LT-1B	790-129-9050	20 g (2 pes.)	Polyethylene container	- Used in places requiring an immediately effective, strong adhesive. - Used for plastics (except polyethylene, polypropylene, tetrafluoroethylene, and vinyl chloride), rubber, metal and non-metal.
	LT-2	09940-00030	50 g	Polyethylene container	- Features: Resistance to heat, chemicals - Used for anti-loosening and sealant purposes for bolts and plugs.
	LT-3	790-129-9060 (Set of adhesive and hardening agent)	Adhesive: 1 kg Hardening agent: 500 g	Can	Used as adhesive or sealant for metal, glass or plastic.
	LT-4	790-129-9040	250 g	Polyethylene container	Used as sealant for machined holes.
	Holtz MH 705	790-126-9120	75 g	Tube	Used as heat-resisting sealant for repairing engine.
	Three bond 1735	179-129-9140	50 g	Polyethylene container	- Quick hardening type adhesive. - Cure time: within 5 sec. to 3 min. - Used mainly for adhesion of metals, rubbers, plastics and woods.
	Aron-alpha 201	790-129-9130	2 g	Polyethylene container	- Quick hardening type adhesive. - Quick cure type (max. strength after 30 minutes). - Used mainly for adhesion of rubbers, plastics and metals.
	Loctite 648-50	79A-129-9110	50 cc	Polyethylene container	- Features: Resistance to heat, chemicals - Used at joint portions subject to high temperature.
Gasket sealant	LG-1	790-129-9010	200 g	Tube	Used as adhesive or sealant for gaskets and packing of power train case, etc.
	LG-3	790-129-9070	1 kg	Can	- Features: Resistance to heat - Used as sealant for flange surfaces and bolts at high temperature locations; used to prevent seizure. - Used as sealant for heat resistant gasket for at high temperature locations such as engine pre-combustion chamber, exhaust pipe.

Category	Code	Part No.	Quantity	Container	Main applications, features
Gasket sealant	LG-4	790-129-9020	200 g	Tube	• Features: Resistance to water, oil • Used as sealant for flange surface, thread. • Also possible to use as sealant for flanges with large clearance. • Used as sealant for mating surfaces of final drive case, transmission case.
	LG-5	790-129-9080	1 kg	Polyethylene container	• Used as sealant for various threads, pipe joints, flanges. • Used as sealant for tapered plugs, elbows, nipples of hydraulic piping.
	LG-6	09940-00011	250 g	Tube	• Features: Silicon based, resistant to heat, cold. • Used as sealant for flange surface, thread. • Used as sealant for oil pan, final drive case, etc.
	LG-7	09920-00150	150 g	Tube	• Features: Silicon based, quick hardening type. • Used as sealant for flywheel housing, intake manifold, oil pan, thermostat housing, etc.
	Three bond 1211	790-129-9090	100 g	Tube	• Used as heat-resisting sealant for repairing engines.
Molybdenum disulphide lubricant	LM-G	09940-00051	60 g	Can	• Used as lubricant for sliding parts (to prevent squeaking).
	LM-P	09940-00040	200 g	Tube	• Used to prevent seizure or scuffing of the thread when press fitting or shrink fitting. • Used as lubricant for linkage, bearings, etc.
Grease	G2-LI	SYG2-400LI SYG2-350LI SYG2-400LI-A SYG2-160LI SYGA160CNLI	Various	Various	• General purpose type
	G2-CA	SYG2-400CA SYG2-350CA SYG2-400CA-A SYG2-160CA SYG2-160CNCA	Various	Various	• Used for normal temperature, light load bearing at places in contact with water or steam.
	Molybdenum disulphide lubricant	SYG2-400M	400 g (10 per case)	Belows type	• Used for places with heavy load.

Standard tightening torque

Standard tightening torque of bolts and nuts

The following charts give the standard tightening torques of bolts and nuts. Exceptions are given in DISASSEMBLY AND ASSEMBLY.

Thread diameter of bolt	Width across flats	 	
		Nm	kgm
mm	mm		
6	10	13.2 ± 1.4	1.35 ± 0.15
8	13	31.4 ± 2.9	3.20 ± 0.3
10	17	65.7 ± 6.8	6.70 ± 0.7
12	19	112 ± 9.8	11.5 ± 1.0
14	22	177 ± 19	18 ± 2.0
16	24	279 ± 29	28.5 ± 3
18	27	383 ± 39	39 ± 4
20	30	549 ± 58	56 ± 6
22	32	745 ± 78	76 ± 8
24	36	927 ± 98	94.5 ± 10
27	41	1320 ± 140	135 ± 15
30	46	1720 ± 190	175 ± 20
33	50	2210 ± 240	225 ± 25
36	55	2750 ± 290	280 ± 30
39	60	3280 ± 340	335 ± 35
Thread diameter of bolt	Width across flats		
		Nm	kgm
mm	mm		
6	10	7.85 ± 1.95	0.8 ± 0.2
8	13	18.6 ± 4.9	1.9 ± 0.5
10	14	40.2 ± 5.9	4.1 ± 0.6
12	27	82.35 ± 7.85	8.4 ± 0.8

Tightening torque of hose nuts

Use these torques for hose nuts.

Nominal No.	Thread diameter	Width across flat	Tightening torque	
	mm	mm	Nm	kgm
02	14	19	24.5 ± 4.9	2.5 ± 0.5
03	18	24	49 ± 19.6	5 ± 2
04	22	27	78.5 ± 19.6	8 ± 2
05	24	32	137.3 ± 29.4	14 ± 3
06	30	36	176.5 ± 29.4	18 ± 3
10	33	41	196.1 ± 49	20 ± 5
12	36	46	245.2 ± 49	25 ± 5
14	42	55	294.2 ± 49	30 ± 5

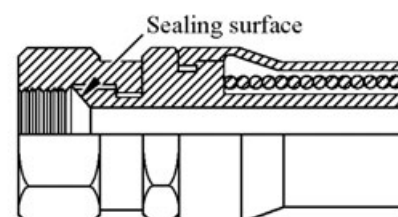
Tightening torque of split flange bolts

Use these torques for split flange bolts.

Thread diameter	Width across flat	Tightening torque	
mm	mm	Nm	kgm
10	14	65.7 ± 6.8	6.7 ± 0.7
12	17	112 ± 9.8	11.5 ± 1
16	22	279 ± 29	28.5 ± 3

Tightening torque for flared nuts

Use these torques for flared part of nut.



Thread diameter	Width across flat	Tightening torque	
mm	mm	Nm	kgm
14	19	24.5 ± 4.9	2.5 ± 0.5
18	24	49 ± 19.6	5 ± 2
22	27	78.5 ± 19.6	8 ± 2
24	32	137.3 ± 29.4	14 ± 3
30	36	176.5 ± 29.4	18 ± 3
33	41	196.1 ± 49	20 ± 5
36	46	245.2 ± 49	25 ± 5
42	55	294.2 ± 49	30 ± 5

Tightening torque for 102 engine series (bolts and nuts)

Use these torque values for bolts and nuts (unit: mm).

Thread diameter	Tightening torque	
mm	Nm	kgm
6	10 ± 2	1.02 ± 0.20
8	24 ± 4	2.45 ± 0.41
10	43 ± 6	4.38 ± 0.61
12	77 ± 12	7.85 ± 1.22

Tightening torque for 102 engine series (eye joints)

Use these torque values for eye joints (unit: mm).

Thread diameter	Tightening torque	
mm	Nm	kgm
6	8 ± 2	0.81 ± 0.20
8	10 ± 2	1.02 ± 0.20
10	12 ± 2	1.22 ± 0.20
12	24 ± 4	2.45 ± 0.41
14	36 ± 5	3.67 ± 0.51

Tightening torque for 102 engine series (tapered screws)

Use these torque values for tapered screws (unit: inch).

Thread diameter	Tightening torque	
inch	Nm	kgm
1/16	3 ± 1	0.31 ± 0.10
1/8	8 ± 2	0.81 ± 0.20
1/4	12 ± 2	1.22 ± 0.20
3/8	15 ± 2	1.53 ± 0.41
1/2	24 ± 4	2.45 ± 0.41
3/4	36 ± 5	3.67 ± 0.51
1	60 ± 9	6.12 ± 0.92

Electric wire code

In the wiring diagrams, various colors and symbols are employed to indicate the thickness of wires. This wire code table will help you understand WIRING DIAGRAMS.

EXAMPLE:

05WB indicates a cable having a nominal number 05 and white coating with black stripe.

Classification by thickness

Nominal number	Copper wire			Cable O.D. (mm)	Current rating (A)	Applicable circuit
	Number of strands	Dia. Of strand (mm)	Cross section (mm)			
0.85	11	0.32	0.88	2.4	12	Starting, lighting, signal etc.
2	26	0.32	2.09	3.1	20	Lighting, signal etc.
5	65	0.32	5.23	4.6	37	Charging and signal
15	84	0.45	13.36	7.0	59	Starting (Glow plug)
40	85	0.80	42.73	11.4	135	Starting
60	127	0.80	63.84	13.6	178	Starting
100	217	0.80	109.1	17.6	230	Starting

Classification by color and code

Priority	Circuits Classification		Charging	Ground	Starting	Lighting	Instrument	Signal	Other
1	Primary	Code	W	B	B	R	Y	G	L
		Color	White	Black	Black	Red	Yellow	Green	Blue
2	Auxiliary	Code	WR	—	BW	RW	YR	GW	LW
		Color	White & Red	—	Black & White	Red & White	Yellow & Red	Green & White	Blue & White
3		Code	WB	—	BY	RB	YB	GR	LR
		Color	White & Black	—	Black & Yellow	Red & Black	Yellow & Black	Green & Red	Blue & Red
4		Code	WL	—	BR	RY	YG	GY	LY
		Color	White & Blue	—	Black & Red	Red & Yellow	Yellow & Green	Green & Yellow	Blue & Yellow
5		Code	WG	—	—	RG	YL	GB	LB
		Color	White & Green	—	—	Red & Green	Yellow & Blue	Green & Black	Blue & Black
6		Code	—	—	—	RL	YW	GL	—
		Color	—	—	—	Red & Blue	Yellow & White	Green & Blue	—

Conversion tables

Method of using the conversion table

The Conversion Table in this section is provided to enable simple conversion of figures. For details of the method of using the Conversion Table, see the example given below.

EXAMPLE:

Method of using the Conversion Table to convert from millimeters to inches.

1. Convert 55 mm into inches.
 - a. Locate the number 50 in the vertical column at the left side, take this as ①, then draw a horizontal line from ①.
 - b. Locate the number 5 in the row across the top, take this as ②, then draw a perpendicular line down from ②.
 - c. Take the point where the two lines cross as ③. This point ③ gives the value when converting from millimeters to inches. Therefore, 55 millimeters = 2.165 inches.
2. Convert 550 mm into inches.
 - a. The number 550 does not appear in the table, so divide by 10 (move the decimal one place to the left) to convert it to 55 mm.
 - b. Carry out the same procedure as above to convert 55 mm to 2.165 inches.
 - c. The original value (550 mm) was divided by 10, so multiply 2.165 inches by 10 (move the decimal one place to the right) to return to the original value. This gives 550 mm = 21.65 inches.

Millimeters to inches		②									
		1 mm = 0,03937 inch									
①		0	1	2	3	4	5	6	7	8	9
	0	0	0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
	10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
	20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
	30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
	40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
							③				
	50	1.969	2.008	2.047	2.087	2.126	2.165	2.205	2.244	2.283	2.323
	60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
	70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
	80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
	90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Millimeters to inches										1 mm = 0,03937 inch
	0	1	2	3	4	5	6	7	8	9
0	0	0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
50	1.969	2.008	2.047	2.087	2.126	2.165	2.205	2.244	2.283	2.323
60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Kilogram to pound										1 mm = 0,03937 inch
	0	1	2	3	4	5	6	7	8	9
0	0	2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	51.91	55.12	57.32	59.53	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.78	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21	101.41	103.62	105.82	108.03
50	110.23	112.44	114.64	116.85	119.05	121.25	123.46	125.66	127.87	130.07
60	132.28	134.48	136.69	138.89	141.10	143.30	145.51	147.71	149.91	152.12
70	154.32	156.53	158.73	160.94	163.14	165.35	167.55	169.76	171.96	174.17
80	176.37	178.57	180.78	182.98	185.19	187.39	189.60	191.80	194.01	196.21
90	198.42	200.62	202.83	205.03	207.24	209.44	211.64	213.85	216.05	218.26

0-5h-wheel-loader-service-repair-workshop-manual/

Liter to U.S. Gallon										1 L = 0.2642 U.S. Gallon
	0	1	2	3	4	5	6	7	8	9
0	0	0.264	0.528	0.793	1.057	1.321	1.585	1.849	2.113	2.378
10	2.642	2.906	3.170	3.434	3.698	3.963	4.227	4.491	4.755	5.019
20	5.283	5.548	5.812	6.076	6.340	6.604	6.869	7.133	7.397	7.661
30	7.925	8.189	8.454	8.718	8.982	9.246	9.510	9.774	10.039	10.303
40	10.567	10.831	11.095	11.359	11.624	11.888	12.152	12.416	12.680	12.944
50	13.209	13.473	13.737	14.001	14.265	14.529	14.795	15.058	15.322	15.586
60	15.850	16.115	16.379	16.643	16.907	17.171	17.435	17.700	17.964	18.228
70	18.492	18.756	19.020	19.285	19.549	19.813	20.077	20.341	20.605	20.870
80	21.134	21.398	21.662	21.926	22.190	22.455	22.719	22.983	23.247	23.511
90	23.775	24.040	24.304	24.568	24.832	25.096	25.361	25.625	25.889	26.153

Liter to U.K. Gallon										1 L = 0.21997 U.K. Gallon
	0	1	2	3	4	5	6	7	8	9
0	0	0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.740	3.950	4.179
20	4.399	4.619	4.839	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.699	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	10.119	10.339	10.559	10.778
50	10.998	11.281	11.438	11.658	11.878	12.098	12.318	12.528	12.758	12.978
60	13.198	13.418	13.638	13.858	14.078	14.298	14.518	14.738	14.958	15.178
70	15.398	15.618	15.838	16.058	16.278	16.498	16.718	16.938	17.158	17.378
80	17.598	17.818	18.037	18.257	18.477	18.697	18.917	19.137	19.357	19.577
90	19.797	20.017	20.237	20.457	20.677	20.897	21.117	21.337	21.557	21.777

Sample of manual. Download All 1302 pages at:

<https://www.arepairmanual.com/downloads/komatsu-wa470-5hwa480-5h-wheel-loader-service-repair-workshop-manual/>