821C Loader Service Manual

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CASE CORPORATION
700 State Street
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CASE CANADA CORPORATION
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Bur 7-13051

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821C Loader Service Manual

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NOTE: Case Corporation reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

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Section Number

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Section

1001

STANDARD TORQUE SPECIFICATIONS

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TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphites, Molydisulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
1/4 inch	108 to 132	12 to 15
5/16 inch	204 to 252	23 to 28
3/8 inch	420 to 504	48 to 57
Size	**Pound Feet**	**Newton metres**
7/16 inch	54 to 64	73 to 87
1/2 inch	80 to 96	109 to 130
9/16 inch	110 to 132	149 to 179
5/8 inch	150 to 180	203 to 244
3/4 inch	270 to 324	366 to 439
7/8 inch	400 to 480	542 to 651
1.0 inch	580 to 696	787 to 944
1-1/8 inch	800 to 880	1085 to 1193
1-1/4 inch	1120 to 1240	1519 to 1681
1-3/8 inch	1460 to 1680	1980 to 2278
1-1/2 inch	1940 to 2200	2631 to 2983

Grade 8 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
1/4 inch	144 to 180	16 to 20
5/16 inch	288 to 348	33 to 39
3/8 inch	540 to 648	61 to 73
Size	**Pound-Feet**	**Newton metres**
7/16 inch	70 to 84	95 to 114
1/2 inch	110 to 132	149 to 179
9/16 inch	160 to 192	217 to 260
5/8 inch	220 to 264	298 to 358
3/4 inch	380 to 456	515 to 618
7/8 inch	600 to 720	814 to 976
1.0 inch	900 to 1080	1220 to 1465
1-1/8 inch	1280 to 1440	1736 to 1953
1-1/4 inch	1820 to 2000	2468 to 2712
1-3/8 inch	2380 to 2720	3227 to 3688
1-1/2 inch	3160 to 3560	4285 to 4827

NOTE: *Use thick nuts with Grade 8 bolts.*

TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when specifications are not given.

These values apply to fasteners with both coarse and fine threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used. Use of a click type torque wrench, or better is required.

Grade 8.8 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
M4	24 to 36	3 to 4
M5	60 to 72	7 to 8
M6	96 to 108	11 to 12
M8	228 to 276	26 to 31
M10	456 to 540	52 to 61
Size	**Pound-Feet**	**Newton metres**
M12	66 to 79	90 to 107
M14	106 to 127	144 to 172
M16	160 to 200	217 to 271
M20	320 to 380	434 to 515
M24	500 to 600	675 to 815
M30	920 to 1100	1250 to 1500
M36	1600 to 1950	2175 to 2600

Grade 10.9 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
M4	36 to 48	4 to 5
M5	84 to 96	9 to 11
M6	132 to 156	15 to 18
M8	324 to 384	37 to 43
Size	**Pound-Inches**	**Newton metres**
M10	54 to 64	73 to 87
M12	93 to 112	125 to 150
M14	149 to 179	200 to 245
M16	230 to 280	310 to 380
M20	450 to 540	610 to 730
M24	780 to 940	1050 to 1275
M30	1470 to 1770	2000 to 2400
M36	2580 to 3090	3500 to 4200

Grade 12.9 Bolts, Nuts, and Studs

Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tub OD Hose ID	Thread Size	Pound-Inches	Newton metres
37 Degree Flare Fitting			
1/4 inch 6.4 mm	7/16-20	72 to 144	8 to 16
5/16 inch 7.9 mm	1/2-20	96 to 192	11 to 22
3/8 inch 9.5 mm	9/16-18	120 to 300	14 to 34
1/2 inch 12.7 mm	3/4-16	180 to 504	20 to 57
5/8 inch 15.9 mm	7/8-14	300 to 696	34 to 79
3/4 inch 19.0 mm	1-1/16-12	40 to 80	54 to 108
7/8 inch 22.2 mm	1-3/16-12	60 to 100	81 to 135
1.0 inch 25.4 mm	1-5/16-12	75 to 117	102 to 158
1-1/4 inch 31.8	1-5/8-12	125 to 165	169 to 223
1-1/2 inch 38.1 mm	1-7/8-12	210 to 250	285 to 338

Tub OD Hose ID	Thread Size	Pound-Inches	Newton metres
Straight Threads with O-ring			
1/4 inch 6.4 mm	7/16-20	144 to 228	16 to 26
5/16 inch 7.9 mm	1/2-20	192 to 300	22 to 34
3/8 inch 9.5 mm	9/16-18	300 to 480	34 to 54
1/2 inch 12.7 mm	3/4-16	540 to 804	57 to 91
5/8 inch 15.9 mm	7/8-14	58 to 92	79 to 124
3/4 inch 19.0 mm	1-1/16-12	80 to 128	108 to 174
7/8 inch 22.2 mm	1-3/16-12	100 to 160	136 to 216
1.0 inch 25.4 mm	1-5/16-12	117 to 187	159 to 253
1-1/4 inch 31.8 mm	1-5/8-12	165 to 264	224 to 357
1-1/2 inch 38.1 mm	1-7/8-12	250 to 400	339 to 542

Split Flange Mounting Bolts		
Size	**Pound-Inches**	**Newton metres**
5/16-18	180 to 240	20 to 27
3/8-16	240 to 300	27 to 34
7/16-14	420 to 540	47 to 61
Size	**Pound-Feet**	**Newton metres**
1/2-13	55 to 65	74 to 88
5/8-11	140 to 150	190 to 203

TORQUE SPECIFICATIONS - O-RING FACE SEAL FITTINGS

Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	Thread Size	Pound-Inches	Newton metres
O-Ring Face Seal End					**O-Ring Boss End Fitting or Lock Nut**		
-4	1/4 inch 6.4 mm	9/16-18	120 to 144	14 to 16	7/16-20	204 to 240	23 to 27
-6	3/8 inch 9.5 mm	11/16-16	216 to 240	24 to 27	9/16-18	300 to 360	34 to 41
-8	1/2 inch 12.7 mm	13/16-16	384 to 480	43 to 54	3/4-16	540 to 600	61 to 68
-10	5/8 inch 15.9 mm	1-14	552 to 672	62 to 76	7/8-14	60 to 65	81 to 88
-12	3/4 inch 19.0 mm	1-3/16-12	65 to 80	90 to 110	1-1/16-12	85 to 90	115 to 122
-14	7/8 inch 22.2 mm	1-3/16-12	65 to 80	90 to 110	1-3/16-12	95 to 100	129 to 136
-16	1.0 inch 25.4 mm	1-7/16-12	92 to 105	125 to 140	1-5/16-12	115 to 125	156 to 169
-20	1-1/4 inch 31.8 mm	1-11/16-12	125 t0 140	170 to 190	1-5/8-12	150 to 160	203 to 217
-24	1-1/2 inch 38.1 mm	2-12	150 to 180	200 to 254	1-7/8-12	190 to 200	258 to 271

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Section 1002

FLUIDS AND LUBRICANTS

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CAPACITIES AND LUBRICANTS

Engine oil
- Capacity with filter change ..... 20.8 litres (22 U.S. quarts)
- Type of oil ..... Case No. 1 Engine Oil - see engine oil recommendations on page 3

Engine cooling system
- Capacity ..... 32.1 litres (34 U.S. quarts)
- Type of coolant ..... Ethylene glycol and water mixed for lowest ambient temperature (at least 50/50 mix)

Fuel tank
- Capacity ..... 268 litres (70.8 U.S. gallons)
- Type of fuel ..... See diesel fuel specifications on page 4

Hydraulic system
- Hydraulic reservoir refill capacity ..... 90 litres (95.2 U.S. quarts)
- Total system ..... 174 litres (184 U.S. quarts)

Type of oil ..... MS-1209 Hy-Tran Ultra®

Transmission
- Refill capacity with filter change ..... 12.3 litres (13 U.S. quarts)
- Total system capacity ..... 26.5 litres (28 U.S. quarts)

Type of oil ..... Case No. 1 Engine Oil (15W-40)

Axles
- Capacity of center bowl
  - Front ..... 18.9 litres (20 quarts) 135H EP Plus 1.9 litres (4 pints) B91246
  - Rear ..... 13.7 litres (14.5 quarts) 135H EP Plus 1.4 litres (3 pints) B91246
- Capacity of planetary (each)
  - Front ..... 6.0 litres (6.5 quarts) 135H EP
  - Rear ..... 5.5 litres (6 quarts) 135H EP
- Type of lubricant ..... Case (MS1316) 135H EP (SAE 85W-140)
- Limited slip additive ..... Case B91246

Brake system
- Type of fluid (same as hydraulic system) ..... MS-1209 Hy-Tran Ultra®

NOTE: *DO NOT use an alternate oil in the axles. The brake components in the axles could be damaged as a result of using an alternate oil.*

Conversion Formulas

Imperial quart = litres x 0.879877
Imperial gallons = litres x 0.219969

ENGINE OIL RECOMMENDATIONS

Engine Oil Selection

Case No. 1 Engine Oil is recommended for use in your Case engine. Case engine oil will lubricate your engine correctly under all operating conditions.

If Case No. 1 Multi-Viscosity or Single Grade Engine Oil is not available, use only oil meeting API engine oil service category CE.

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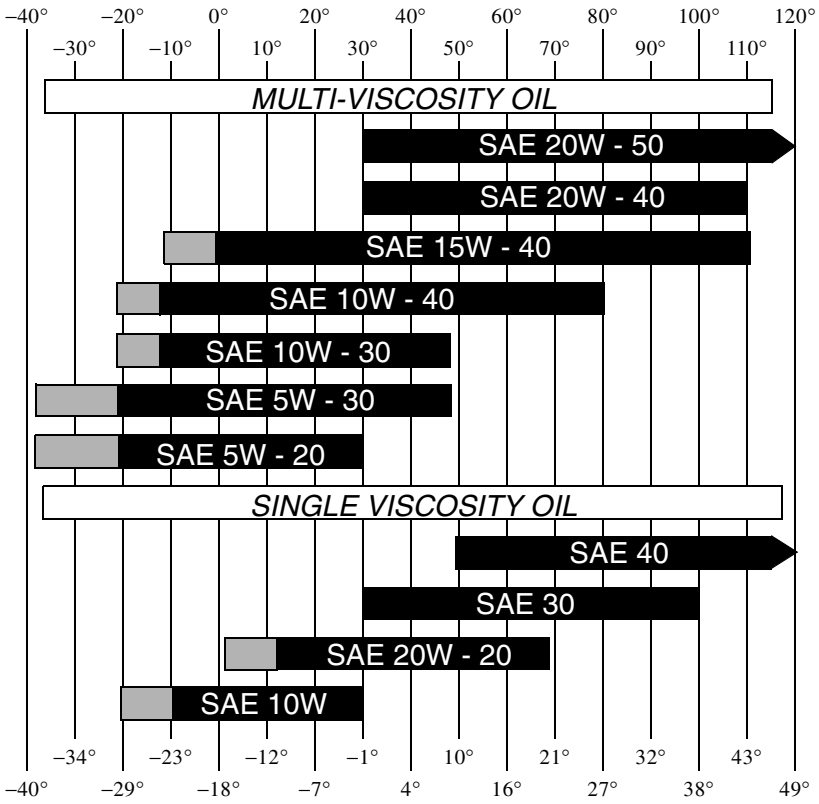
See the chart below for recommended viscosity at ambient air temperature ranges.

NOTE: *Do not put performance additives or other oil additive products in the engine crankcase. The oil change intervals given in this manual are according to tests with Case lubricants.*

Oil Viscosity / Temperature Ranges

Temperature Fahrenheit



Temperature Celsius

NOTE: *Use of an engine oil pan heater or an engine coolant heater is required when operating temperatures are in the shaded area.*

DIESEL FUEL SYSTEM

Use No. 2 diesel fuel in the engine of this machine. The use of other fuels can cause the loss of engine power and high fuel consumption.

In very cold temperatures, a mixture of No. 1 and No. 2 diesel fuels is temporarily permitted. See the following Note.

NOTE: *See your fuel dealer for winter fuel requirements in your area. If the temperature of the fuel lowers below the cloud point (wax appearance point), wax crystals in the fuel will restrict the fuel filter and cause the engine to lose power or not start.*

The diesel fuel used in this machine must meet the specifications shown below in, “Specifications for Acceptable No. 2 Diesel Fuel”, or Specification D975-81 of the American Society for Testing and Materials.

Fuel Storage

If you keep fuel in storage for a period of time, you can get foreign material or water in the fuel storage tank. Many engine problems are caused by water in the fuel.

Keep the fuel storage tank outside and keep the fuel as cool as possible. Remove water from the storage container at regular periods of time.

Fill the fuel tank at the end of the daily operating period to prevent condensation in the fuel tank.

Specifications for Acceptable No. 2 Diesel Fuel

API gravity, minimum	34
Flash point, minimum	140°F (60°C)
Cloud point (wax appearance point), maximum	-5°F (-20°C) See Note above
Pour point, maximum	-15°F (-26°C) See Note above
Distillation temperature, 90% point	540 to 640°F (282 to 338°C)
Viscosity, at 100°F (38°C)	
Centistokes	2.0 to 4.3
Saybolt seconds universal	32 to 40
Cetane number, minimum	43 (45 to 55 for winter or high altitudes)
Water and sediment, by volume, maximum	0.05 of 1%
Sulphur, by weight, maximum	0.5 of 1%
Copper strip corrosion, maximum	No. 2
Ash, by weight, maximum	0.01 of 1%

MAINTENANCE SCHEDULE
Model 821C
Instructions

AS REQUIRED

22 SERVICE THE AIR CLEANER IF THE AIR CLEANER WARNING LAMP ILLUMINATES ..... SEE OPERATORS MANUAL
37 SERVICE AIR CLEANER PRECLEANER ..... SEE OPERATORS MANUAL
30 REPLACE THE TRANSMISSION FILTER
IF THE TRANSMISSION FILTER RESTRICTION WARNING LAMP ILLUMINATES ..... USE CASE FILTER
19 CHECK THE RADIATOR COOLANT LEVEL IF THE WARNING LAMP ILLUMINATES ..... SEE OPERATORS MANUAL
6 REPLACE THE HYDRAULIC FILTERS IF THE HYDRAULIC FILTER WARNING LAMP ILLUMINATES ..... USE CASE FILTERS
20 CHECK THE FAN BELT CONDITION ..... REPLACE AS REQUIRED
CHECK THE AIR CONDITIONING DRIVE TENSION (IF EQUIPPED) NOT SHOWN ..... ADJUST AS REQUIRED

EVERY 10 HOURS OF OPERATION OR EACH DAY- WHICHEVER OCCURS FIRST

16 CHECK THE ENGINE OIL LEVEL ..... SEE OPERATORS MANUAL

EVERY 50 HOURS OF OPERATION

1 CHECK THE COOLANT RESERVOIR FLUID LEVEL ..... ETHYLENE GLYCOL AND WATER
29 CHECK THE TRANSMISSION OIL LEVEL (ENGINE RUNNING AND OIL WARM) ..... SEE OPERATORS MANUAL
5 CHECK THE HYDRAULIC RESERVOIR FLUID LEVEL ..... SEE OPERATORS MANUAL
15 LUBRICATE THE REAR AXLE TRUNNION PIVOTS (2 FITTINGS) ..... CASE MOLYDISULFIDE GREASE
27 LUBRICATE THE CENTER DRIVE SHAFT SLIP JOINT (1 FITTING) ..... CASE MOLYDISULFIDE GREASE

EVERY 100 HOURS OF OPERATION

10 LUBRICATE THE BUCKET PIVOT POINTS (3 FITTINGS) ..... CASE MOLYDISULFIDE GREASE
7 LUBRICATE THE STEERING CYLINDER PIVOTS - ROD AND CLOSED END (4 FITTINGS) ..... CASE MOLYDISULFIDE GREASE
9 LUBRICATE THE LOADER PIVOT POINTS (10 FITTINGS) ..... CASE MOLYDISULFIDE GREASE
26 LUBRICATE THE FRONT DRIVE SHAFT SUPPPORT BEARING (1 FITTING) ..... CASE MOLYDISULFIDE GREASE
32 LUBRICATE THE REAR DRIVE SHAFT SLIP JOINT (1 FITTING) ..... CASE MOLYDISULFIDE GREASE
35 LUBRICATE THE REAR DRIVE SHAFT SLIP JOINT (1) FITTING) ..... CASE MOLYDISULFIDE GREASE

EVERY 250 HOURS OF OPERATION

19 CHECK THE RADIATOR COOLANT LEVEL ..... ETHYLENE GLYCOL AND WATER
2 CHANGE THE ENGINE OIL AND REPLACE THE ENGINE OIL FILTER ..... SEE OPERATORS MANUAL
34 CHECK THE BATTERY FLUID LEVEL ..... SEE OPERATORS MANUAL
36 CHECK THE TIRE CONDITION AND AIR PRESSURE ..... SEE OPERATORS MANUAL
12 CLEAN THE CAB AIR FILTERS (IF EQUIPPED) ..... SEE OPERATORS MANUAL
25 REPLACE ENGINE COOLING SYSTEM FILTER ..... USE CASE FILTER

EVERY 500 HOURS OF OPERATION

3 REPLACE THE FUEL FILTERS ..... USE CASE FILTERS
33 DRAIN WATER AND SEDIMENT FROM THE FUEL TANK ..... SEE OPERATORS MANUAL
14 REPLACE THE IN-LINE FUEL FILTER ..... USE CASE FILTERS

EVERY 1000 HOURS OF OPERATION

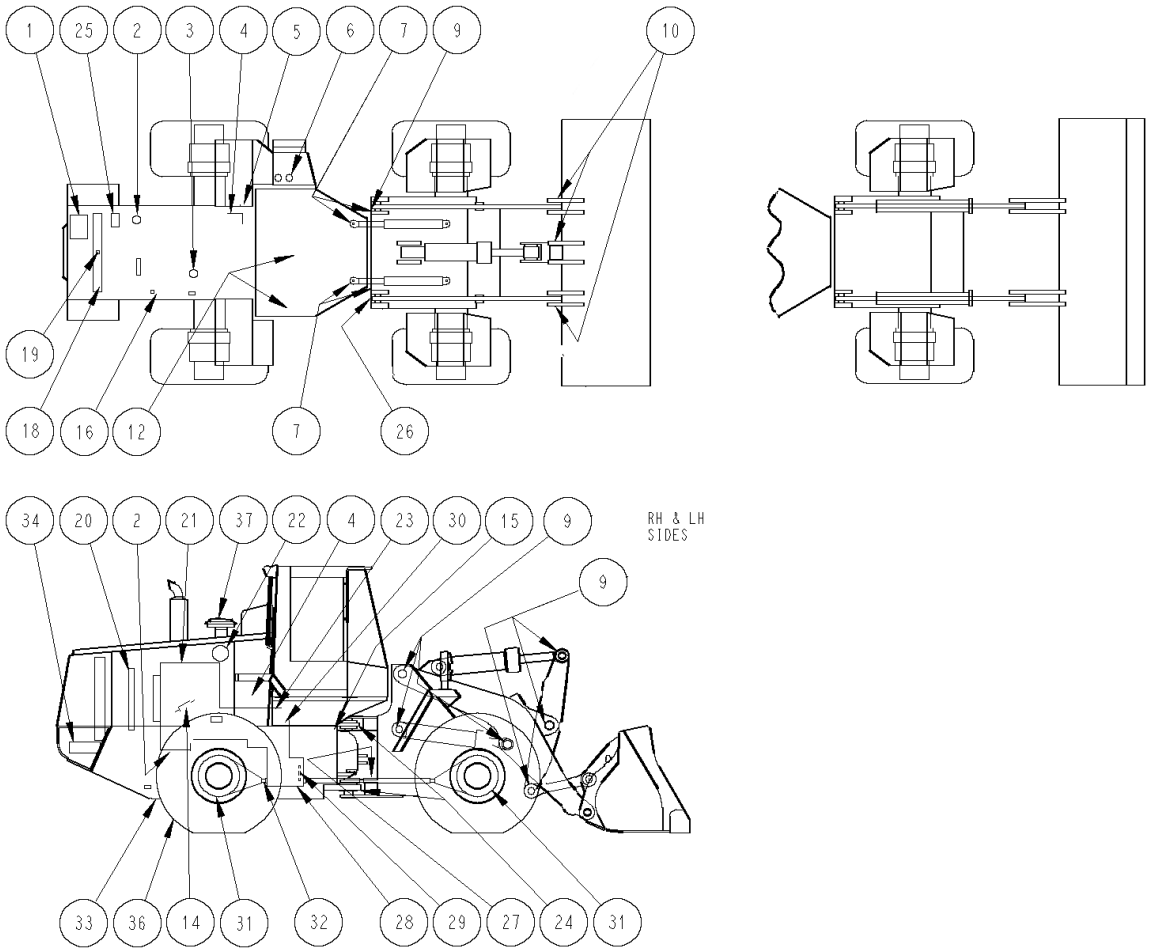
21 CHECK THE ENGINE VALVE CLEARANCES ..... SEE SERVICE MANUAL
6 REPLACE THE HYDRAULIC FILTERS ..... USE CASE FILTERS
30 REPLACE THE TRANSMISSION OIL FILTER ..... USE CASE FILTERS
28 CHANGE THE TRANSMISSION OIL ..... SEE OPERATORS MANUAL
23 CLEAN THE TRANSMISSION BREATHER ..... CLEAN WITH SOLVENT
24 LUBRICATE THE UPPER AND LOWER CHASSIS PIVOTS (2 FITTINGS) ..... CASE MOLYDISULFIDE GREASE
31 CHANGE THE FRONT/REAR AXLE DIFFERENTIAL AND PLANETARY OIL ..... SEE OPERATORS MANUAL

EVERY 2000 HOURS OF OPERATION OR EACH YEAR - WHICHEVER OCCURS FIRST

4 CHANGE THE HYDRAULIC OIL AND CLEAN THE SCREEN ..... SEE OPERATORS MANUAL
18 DRAIN, FLUSH AND REFILL THE ENGINE COOLING SYSTEM ..... ETHYLENE GLYCOL AND WATER
22 REPLACE THE AIR CLEANER ELEMENTS ..... USE CASE FILTERS

NOTE: *When you drain, flush and refill the engine cooling system, add one container (0.5L) of Case cooling system treatment, and replace the cooling filter.*

MAINTENANCE SCHEDULE
Model 821C



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If you operate the machine in severe conditions, lubricate and service the machine more frequently. It is recommended that you see your Case dealer for information on the System Guard Lubrication Analysis System.

See your Operators manual for maintenance of safety related items and for detailed information of the service items on this chart. Operators and service manuals are available for this machine from your Case dealer.

NOTE: *The Case Company reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.*

LOCTITE PRODUCT CHART

Product	Color	Similar Products	Gap (In Inches)	Strength (Steel/Steel)	Working Temperature Range-Farenheit	Fixture/Full Cure (Steel/Steel) Time	Primer	Description
518	Red	515	0.030	500psi	-65 to +300	1hr/24 hrs	764	Gasket Eliminator 518 for Aluminum
542	Brown	569	N/A	132/92 in lbs	-65 to +300	2 hr/24 hrs	747	Hydraulic Sealant
545	Purple		N/A	25/20 in lbs	-65 to +300	4 hr/24 hrs	747	Low Strength Pneumatic/Hydraulic Sealant
549	Orange	504	0.020	2500 psi	-65 to +300	2 hr/24 hrs	747	Instant Seal Plastic Gasket
554	Red	277	0.015	240/240 in lbs	-65 to +300	2 to 4 hrs/24 hrs	764	Refrigerant Sealant
567	White	592	N/A	500 psi	-65 to +400	4 hrs/24 hrs	764	Pipe Sealant for Stainless Steel
568	Orange	277	0.015	2500 psi	-65 to +300	12 hrs/24 hrs	764	Plastic Gasket
569	Brown	545	0.010	40/25 in lbs	-65 to +300	1 hr/24 hrs	764	Hydraulic Sealant
570	Brown	592	N/A	25/40 in lbs	-65 to +300	6 hrs/72 hrs	764	Steam Sealant
571	Brown	592	0.015	40/20 in lbs	-65 to +300	2 to 4 hrs/24 hrs	764	Pipe Sealant
572	White	578.575	N/A	80/27 in lbs	-65 to +300	24 hrs/72 hrs	None	Gasketing
592	White		0.020	500 psi	-65 to +400	4 hrs/72 hrs	736	Pipe Sealant with Teflon
593	Black		0.250	400 psi	-95 to +400	30 min/24 hrs	N/A	RTV Silicone
601	Green	609	0.005	3000 psi	-65 to +300	10 min/24 hrs	764	Current PIN #609
609	Green		0.005	3000 psi	-65 to +300	10 min/24 hrs	764	General Purpose Retaining Compound
620	Green	640	0.015	3000 psi	-65 to +450	30 min/24 hrs	747	High Temperature Retaining Compound
635	Green	680	0.010	4000 psi	-65 to +300	1 hr/24 hrs	747	High Strength Retaining Compound
638	Green	680	0.015	4100 psi	-65 to +300	10 min/24 hrs	747	High Strength Retaining Compound
640	Green	620	0.007	3000 psi	-65 to +400	1 hr/24 hrs	747	High Temperature Retaining Compound
660	Silver		0.020	3000 psi	-65 to +300	20 min/24 hrs	764	Quick Metal
675	Green	609	0.005	3000 psi	-65 to +300	20 min/24 hrs	747	General Purpose Retaining Compound
680	Green	635	0.015	4000 psi	-65 to +300	10 min/24 hrs	747	High Strength Retaining Compound
706	Clear	755	N/A	N/A	N/A	N/A	N/A	Cleaning Solvent
707	Amber		N/A	N/A	N/A	N/A	N/A	Activaltor for Structural Adhesives
736	Amber		N/A	N/A	N/A	N/A	N/A	Primer NF
738	Amber		N/A	N/A	N/A	N/A	N/A	Depend Activator
747	Yellow	N/A	N/A	N/A	N/A	N/A	N/A	Primer T
751	Clear		N/A	N/A	N/A	N/A	N/A	Activator for Structural Adhesives
755	Clear		N/A	N/A	N/A	N/A	N/A	Cleaning Solvent
764	Green		N/A	N/A	N/A	N/A	N/A	Primer N
767	Silver		N/A	N/A	-65 to +1600	N/A	N/A	Anti-Seize Lubricant

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LOCTITE PRODUCT CHART

Product	Color	Similar Products	Gap (In Inches)	Strength (Steel/Steel)	Working Temperature Range-Farenheit	Fixture/Full Cure (Steel/Steel) Time	Primer	Description
#3	Dark Brown					24 hr	N/A	Form a Gasket (works with oil, fuel or grease) Pliable
80	Yellow					Fast	N/A	Weatherstrip Adhesive
123	Clear					N/A	N/A	Parts Cleaner Fluid
220	Blue	290	0.003	57/143 in lbs	-65 to +250	6 min/24 hrs	747	Wicking Threadlocker
221	Purple	222	0.005	75/44 in lbs	-65 to +300	2 min/24 hrs	747	Low Strength Threadlocker
222	Purple		0.005	53/30 in lbs	-65 to +300	20 min/24 hrs	764	Low Strength Threadlocker (Small Screws)
225	Brown	222	0.010	45/25 in lbs	-65 to +300	7 min/24 hrs	747	Low Strength Threadlocker
242	Blue		0.005	80/50 in lbs	-65 to +300	10 min/24 hrs	764	Medium Strength Threadlocker
262	Red	271	0.005	160/190 in lbs	-65 to +300	5 min/24 hrs	747	High Strength Threadlocker
270	Green	271	0.007	160/320 in lbs	-65 to +300	3 min/24 hrs	747	High Strength Threadlocker
271	Red	262	0.007	160/320 in lbs	-65 to +300	10 min/24 hrs	764	High Strength Threadlocker
272	Red	620	0.007	180/220 in lbs	-65 to +450	30 min/24 hrs	764	High Temperature, High Strength
275	Green	277	0.010	210/300 in lbs	-65 to +300	3 min/24 hrs	747	High Strength Threadlocker
277	Red		0.010	225/300 in lbs	-65 to +300	60 min/24 hrs	764	High Strength Threadlocker
290	Green		0.003	85/350 in lbs	-65 to +300	6 min/24 hrs	764	Wicking Threadlocker
*404	Clear	495	0.006	3200 psi	-65 to +180	30 sec/24 hrs	NA	Instant Adhesive
*406	Clear		0.004	3200 psi	-65 to +180	15 sec/24 hrs	N/A	Surface Insensitive Adhesive
*409	Clear	454	0.008	2500 psi	-65 to +180	50 sec/24 hrs	N/A	Gel Instant Adhesive
*414	Clear		0.006	2500 psi	-65 to +180	30 sec/24 hr	N/A	Instant Adhesive
*415	Clear	454	0.010	2500 psi	-65 to +180	50 sec/24 hrs	N/A	Gap Filling Instant Adhesive (Metals)
*416	Clear	454	0.010	2500 psi	-65 to +180	50 sec/24 hrs	N/A	Gap Filling Instant Adhesive (Plastics)
*420	Clear		0.002	2500 psi	-65 to +180	15 sec/24 hrs	N/A	Wicking Instant Adhesive
*422	Clear	454	0.020	2800 psi	-65 to +180	60 sec/24 hrs	N/A	Gap Filling Instant Adhesive
*430	Clear		0.005	2500 psi	-65 to +180	20 sec/24 hrs	N/A	Metal Bonding Adhesive
*445	White/Black		0.250	2000 psi	-65 to +180	5 min/24 hrs	N/A	Fast Setting 2 Part Epoxy
*454	Clear		0.010	3200 psi	-65 to +180	15 sec/24 hrs	N/A	Surface Insensitive Gen Instant Adhesive
*495	Clear		0.004	2500 psi	-65 to +180	20 sec/24 hrs	N/A	General Purpose Instant Adhesive
*496	Clear		0.005	2500 psi	-65 to +180	20 sec/24 hrs	N/A	Metal Bonding Adhesive
504	Brt Orange	515	0.030	750 psi	-65 to +300	90 min/24 hrs	None	Rigid Gasket Eliminator
509	Light Blue		0.020	750 psi	-65 to +320	6 hr/72 hrs	764	Flange Sealant
510	Red		0.020	1000 psi	-65 to +400	30 min/24 hrs	764	High Temperature, GAsket Eliminator
515	Purple		0.010	750 psi	-65 to +300	1 hr/24 hrs	764	Gasket Eliminator 515

Rac 8-98902

* Products 404-496 (except for #445) are all instant adhesives (super glues) they differ mostly in viscosity

Printed in U.S.A.

SECTION INDEX - ENGINE

Section Title

Section Number

For Engine Repair, See the Engine Service Manual.

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CASE CANADA CORPORATION
450 Sherman Avenue
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Bur 7-13080

2000

Section

2000

ENGINE AND RADIATOR REMOVAL AND INSTALLATION

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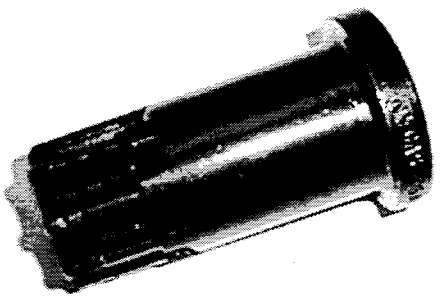
Cooling system capacity ..... 32.2 litres (34 U.S. quarts) of coolant

SPECIAL TOOLS



BD98J200

CAS-1690 Tool used to rotate the flywheel

ENGINE

Removal

1. Park the machine on a level surface and lower the loader bucket to the floor. Stop the engine and apply the parking brake.

2. Let the engine cool. Loosen the cap screw that fastens the cover for the radiator cap and move the cover. Remove the radiator cap. Drain the cooling system. The drain valve is located at the right front side of the radiator. The cooling system holds 32.2 litres (34 U.S. quarts) of coolant.

3. Loosen the filler cap in the reservoir to release any air in the reservoir.

4. Open the access door on each side of the engine compartment.

5. Turn the master disconnect switch to the OFF position.

6. Open the grille.

7. Remove the precleaner. If the air cleaner is equipped with a cap, loosen the clamp and remove the cap.

8. Disconnect the hoses from the tubes for the oil cooler. Install a cap on each hose and plug in each tube fitting.

9. Remove the plugs and loosen and remove the cap screws, lock washers, and flat washers that fasten the hood.

10. Connect suitable lifting equipment to the hood and remove the hood.

11. Disconnect the ground cables and the positive cables from the batteries.

12. Loosen the self-locking nuts on the bolts for the battery hold down brackets. Remove the battery hold down brackets.

13. Have another person help you with this step. Remove both batteries.

14. If your machine is equipped with additional counterweights, connect suitable lifting equipment to one of the additional counterweights. The weight of an additional counterweight is 227 kg (500 pounds) or 453 kg (1000 pounds).

15. Loosen and remove the outside nuts and hardened washers from the studs that fasten the additional counterweight.

16. Remove the additional counterweight.

17. Connect suitable lifting equipment to the large counterweight. The weight of the large counterweight is 545 kg (1200 pounds).

18. Loosen and remove the inside nuts and hardened washers from the studs for the large counterweight.

NOTE: *If your machine is equipped with large counterweights only, loosen and remove the nuts and hardened washers from the bolts that fasten the large counterweights to the machine.*

19. Remove the large counterweight from the machine.

20. Repeat steps 14 through 19 for the other counterweight(s).

21. If the machine is equipped with ether injection, disconnect the tube from the valve.

22. If the machine is equipped with ether injection, disconnect the wire harness from the connector.

23. If the machine is equipped with ether injection, cut the tie strap that fastens the wire harness to the bracket.

24. If the machine is equipped with a backup alarm, disconnect the wires from the backup alarm and pull the wires through the grommet.

25. Cut the tie strap that fastens the connectors to the wire harness for the lamps at the right side of the radiator shroud. Disconnect both connectors.

26. Loosen and remove the nut, lock washer, and bolt that fasten the clamp for the wire harness to the right side of the top of the radiator shroud.

27. Loosen and remove the nut, lock washer, and bolt that fasten the clamp for the wire harness to the left side of the top of the radiator shroud.

28. Cut the tie strap that fastens the connectors to the wire harness for the lamps at the left side of the radiator shroud. Disconnect both connectors.

29. Loosen and remove the self-locking nuts that fasten the clamps for the wire harness to the upper left side of the radiator shroud.

30. Disconnect the connector for the wire harness. Loosen and remove the self-locking nuts and flat washers that fasten the clamps for the battery cables and the wire harness to the left side of the radiator shroud. Move the wire harness out of the way.

31. Loosen and remove the self-locking nuts and flat washers that fasten the bracket for the master disconnect switch to the radiator shroud.

32. Disconnect the cables and wires from the master disconnect switch. Fasten an identification tag to one of the cables and one of the wires. Pull the cables and wires through the radiator shroud. Put the cables and wires out of the way.

33. Loosen and remove the self-locking nuts, hardened washers, and bolts that fasten the front of each side of the radiator shroud to the frame.

34. Loosen and remove the self-locking nuts, hardened washers, and bolts that fasten the rear of each side of the radiator shroud to the frame.

35. Disconnect the top radiator hose.

36. Disconnect the small hose.

37. Loosen and remove the cap screws, lock washers, and flat washers, that fasten the guard to the fan shroud.

NOTE: *There may be spacers between the guard and the fan shroud.*

38. Remove the guard.

39. Loosen and remove the cap screws, lock washers, and flat washers that fasten the fan shroud to the radiator. Remove the fan shroud.

40. Disconnect the bottom radiator hose from the radiator.

41. Connect suitable lifting equipment to the radiator shroud.

42. Raise the radiator shroud until the radiator shroud is free of the frame and remove the radiator shroud from the machine.

43. Lower the radiator shroud and put blocks under each side.

44. Loosen the nuts on the U-bolt for the muffler clamp.

45. Loosen and remove the nuts, lock washers, flat washers, and bolts that fasten the bracket for the muffler to the bracket on the engine.

46. Remove the muffler.

47. Disconnect the wires from the switch for the air cleaner indicator.

48. Disconnect the hose from the turbocharger.

49. Loosen and remove the nuts and bolts that fasten the straps for the air cleaner.

50. Remove the air cleaner from the bracket. Use tape to cover the inlets to the engine and air cleaner.

51. If the machine is equipped with a heater, disconnect the hose from the shutoff valve. Install a plug in the hose.

52. Disconnect the bottom radiator hose from the connector at the engine.

53. Remove the boot and loosen and remove the nut and lock washer that fasten the wire to the battery terminal on the alternator. Remove the wire.

54. Remove the boot and loosen and remove the nut and lock washer that fasten the small wire to the alternator. Remove the small wire.

55. Loosen and remove the cap screw that fastens the clamp for the wire harness to the engine.

56. Loosen and remove the brass nut and brass washers that fasten both ground cables to the stud on the engine. The ground cable connected to the starter can stay. Remove the other ground cable and install the brass washers and brass nut on the stud.

57. Disconnect the hose for the transmission oil cooler from the fitting at the engine. Install a plug in the hose.

58. If the machine is equipped with a heater, disconnect the hose from the top fitting. Install a plug in the hose.

59. Disconnect the cables from the battery terminal of the starter solenoid.

60. Fasten identification tags to the cables for the starter solenoid.

NOTE: *Disconnect the cables from the switch terminal of the starter solenoid.*

61. Disconnect the wire from the temperature sender.

62. If the machine is equipped with a heater, loosen and remove the cap screw and lock washer that fasten the clamp for the hoses to the left side of the flywheel housing.

63. Loosen and remove the brass nut and brass flat washers that fasten the wires to the stud in the left side of the flywheel housing. Remove the wires.

NOTE: *If the machine is equipped with an air conditioner, do Steps 64 through 73. If the machine is not equipped with an air conditioner, go to Step 74.*

64. Disconnect the connectors for the compressor.

65. Cut the tie straps that fasten the wire harness to the compressor hose.

66. If the machine is equipped with ether injection, disconnect the connector for the temperature switch.

67. If the machine is equipped with ether injection, disconnect the tube fitting from the intake manifold.

68. Loosen and remove the nuts, lock washers, and bolts that fasten the clamps for the compressor hoses and the wire harness to the bracket on the engine.

69. Loosen and remove the cap screw, lock washer, and flat washer that fasten the adjusting strap for the compressor.

70. Push the compressor toward the engine and remove the belt from the pulley of the compressor.

71. Loosen and remove the nut, lock washer, and flat washer from the bolt at the base of the compressor.

72. Remove the bolt and flat washers that fasten the compressor to the bracket.

73. Use a piece of wire to tie the compressor so that the compressor is out of the way.

74. Loosen and remove the self-locking nuts and flat washers on the U-bolt that fasten the fuel filler neck to the frame. Remove the U-bolt.

75. Loosen the top hose clamp at the bottom of the fuel filler neck and remove the fuel filler neck. Cover or plug the opening in the fuel tank.

76. Disconnect the fuel return hose from the fuel injection pump. Install a plug in the hose. Follow the hose down and remove the cap screw that fastens the hose clamp to the timing gear cover.

77. Disconnect the throttle cable (1) from the lever on the fuel injection pump, refer to Figure 1.

78. Loosen and remove the nuts, lock washers, and bolts that fasten the clamp for the throttle cable to the bracket on the engine. Move the throttle cable out of the way.

79. Disconnect the wiring harness from the bracket.

80. Remove the cap from the hydraulic reservoir. Connect a vacuum pump to the reservoir. Start the vacuum pump.

81. Actuate both brake pedals several times to discharge the brake accumulators.

82. Disconnect the brake pump inlet and outlet lines. Cap or plug the open fittings and hose connections.

83. Stop the vacuum pump.

84. Disconnect the connector for the fuel shutoff solenoid. Disconnect the connector for the oil pressure switch.

85. If the machine is equipped with optional gauges, disconnect the wire at the sender for the oil pressure gauge.

86. Disconnect the fuel supply hose from the hand primer pump. Install a plug in the hose.

87. Remove the bolt that fastens the harness to the top right side of flywheel housing (5), refer to Figure 1.

88. Remove the hose from the bracket at the cover. Loosen the bottom cap screw and loosen and remove the top cap screw that fastens the bracket and cover to the flywheel housing (5).

89. Remove the plastic plug from the flywheel housing (5).

90. There are four 10 mm Allen head screws that fasten the flex plates to the flywheel. Only one Allen head screw at a time can be removed. The flywheel must be rotated to align each Allen head screw with the hole. Do the following procedure to remove the four Allen head screws.

91. Install the CAS-1690 tool and rotate the flywheel to align an Allen head screw with the hole below.

92. Loosen and remove the Allen head screw. Rotate the flywheel and continue this procedure to remove the remaining Allen head screws.

93. Loosen and remove the cap screws that fasten the panels under each side of the cab.

94. Remove the panels.

95. Connect suitable lifting equipment to the engine.

96. Loosen and remove the cap screws and lock washers that fasten the clamps for the wire harness, and the bracket for the heater hoses, if equipped, to the flywheel housing. Loosen and remove the remaining cap screws and lock washers that fasten the transmission to the flywheel housing.

97. Remove the bolt (6), washer (7), and nut (8) that fastens the front engine mount (2) to the engine weldment mount (3).

NOTE: *Put a container below the torque converter housing for the oil that will drain from the torque converter.*

98. Move the engine (4) straight rearward approximately 50 mm (2 inches).

NOTE: *Check to make sure that the torque converter is free of the engine and pushed all the way onto the transmission shafts.*

99. Raise the engine and remove the engine from the machine.

Installation

1. Make sure the torque converter is installed on the transmission. Three splined shafts must be engaged for the torque converter to be installed correctly.

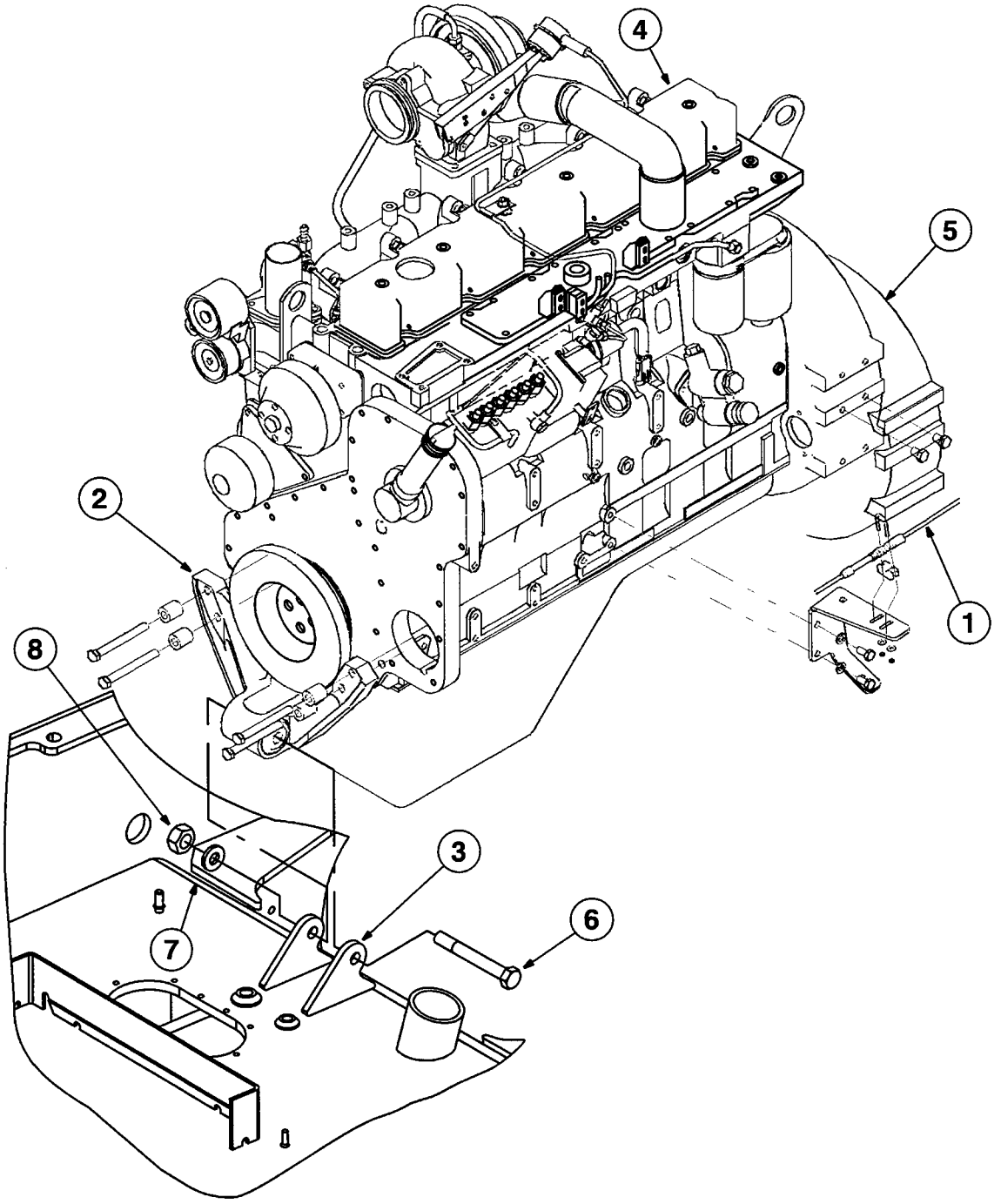
2. Install a stud 70 mm (2-3/4 inches) long with 10 mm threads in one of the holes in the flex plates so the stud is to the left side of the machine. Make sure the flex plates are not bent or damaged.

3. Carry the engine (4) over the frame.

4. Move the engine (4) forward and lower the engine.

5. Push the engine (4) toward the front. Have another person align the stud with the hole in the flywheel.

6. Install the cap screws and lock washers that fasten the clamps for the wire harness, and the bracket for the heater hose to the flywheel housing (5). Install the remaining cap screws and lock washers that fasten the transmission to the flywheel housing (5). Tighten the cap screws to 54 to 60 Nm (480 to 528 pound-inches).



1. THROTTLE CABLE
2. FRONT ENGINE MOUNT
3. ENGINE WELDMENT MOUNT
4. ENGINE
5. FLYWHEEL HOUSING
6. BOLT
7. WASHER
8. NUT

Figure 1. ENGINE

7. Align the engine support bracket with the rear frame and install the bolt, washer, and nut. Tighten the bolt to 366 to 439 Nm (270 to 324 pound-feet).

8. Disconnect and remove the lifting equipment from the engine (4), refer to Figure 1.

9. Install the panels under each side of the cab.

10. Install and tighten the cap screws.

11. Install the CAS-1690 tool to turn the flywheel. Remove the stud from the flex plates and install an Allen head screw.

12. Rotate the flywheel and install the remaining Allen head screws.

13. Tighten all of the Allen head screws to 43 to 49 Nm (360 to 408 pound-inches).

14. Remove the CAS-1690 tool and install the plastic plug in the flywheel housing (5).

15. Install the cover and the bracket for the hose. Install the cap screw and tighten both cap screws. Install the hose in the bracket.

16. Install the cap screw and lock washer that fasten the clamp for the wire harness to the top right side of the flywheel housing (5). Tighten the cap screw.

17. Remove the plug from the fuel supply hose and connect the fuel supply hose to the hand primer pump.

18. If the machine is equipped with optional gauges, connect the wire to the sender for the oil pressure switch.

19. Connect the connector for the oil pressure switch. Connect the connector for the fuel shutoff solenoid.

20. Fasten the wiring harness to the bracket.

21. Install the clamp and throttle cable on the bracket and install the bolts, lock washers and nuts.

22. Connect the throttle cable to the lever on the fuel injection pump.

23. Remove the plug from the fuel return hose and connect the fuel return hose to the fuel injection pump.

24. Follow down the hose and install the cap screw that fastens the clamp for the fuel return hose to the timing gear cover.

25. Remove the cover or plug from the opening in the fuel tank. Install the fuel filler neck and tighten the top hose clamp.

26. Install the U-bolt, flat washers, and self-locking nuts that fasten the fuel filler neck to the frame. Tighten the self-locking nuts.

NOTE: *If the machine is equipped with an air conditioner, do Steps 27 through 37. If the machine is not equipped with an air conditioner, go to Step 38.*

27. Remove the wire that was used to tie the compressor out of the way and install the compressor on the bracket. Align the compressor with the bracket and install the bolt and flat washers.

28. Install the flat washer, lock washer, and nut on the bolt and tighten the nut.

29. Install the belt on the pulley for the compressor.

30. Install the cap screw, lock washer, and flat washer that fasten the adjusting strap for the compressor. Do not tighten the cap screw all the way at this time.

31. Use a prybar to move the compressor away from the engine. Tighten the cap screw.

32. Check the tension on the belt with a tension gauge. The tension for a new belt is 45 kg (100 pounds). The tension for a used belt is 41 kg (90 pounds).

33. Install the bolts, lock washers, and nuts that fasten the clamps for the compressor hoses and the wire harness to the bracket on the engine. Tighten the nuts.

34. If the machine is equipped with ether injection, connect the tube fitting to the intake manifold.

35. If the machine is equipped with ether injection, connect the connector for the temperature switch.