TABLE OF CONTENTS

Reprinted

CASE CORPORATION 8-41040 PRINTED IN U.S.A.
March 1982

Section
1001

SAFETY RULES
SERVICE MANUAL INTRODUCTION
AND
TORQUE SPECIFICATIONS

Written In *Clear*
And
Simple
English

CASE CORPORATION

9-41040
March 1982

PRINTED IN U.S.A.

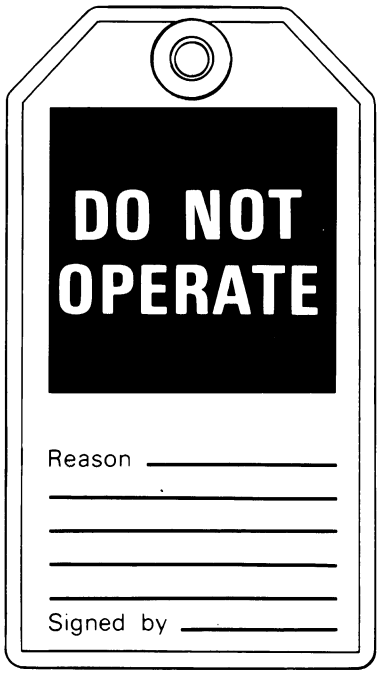
SAFETY RULES

This Symbol Shows Important Information About Safety In This Manual. When You See This Symbol, Carefully Read The Information That Follows and Understand The Possible Causes of Injury Or Death. 1-1-A

IMPORTANT: *To prevent injury on the job, follow the Warning, Caution, and Danger notes in this section and other sections throughout this manual. Follow the instructions carefully.*

The procedures recommended and shown in this manual are good, effective service methods. However, all possible procedures and service hazards may not be covered. Therefore, if you use a tool or procedure not recommended, you must make sure that the method you select is a safe method.

Put the warning tag shown below on the key for the key switch when you are servicing or repairing this machine. One warning tag is on every new machine. You can buy additional warning tags, part number 331-4614, from Service Parts Supply.



780449

Figure 1

DANGER: *Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. If you do not have an exhaust pipe extension, open the doors and get outside air into the area.* 48-56

WARNING: *Read operator's manual to familiarize yourself with control lever functions.* 46-27

WARNING: *Operate tractor and equipment controls from the seat position only. Any other method could result in serious injury.* 48-55

WARNING: *This is a one man machine, no riders allowed.* 35-8

WARNING: *If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.* 45-3-A

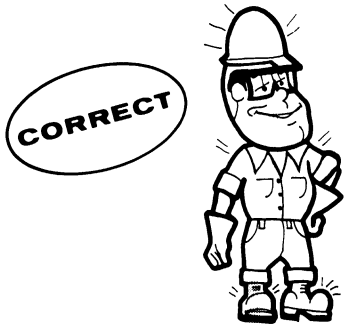
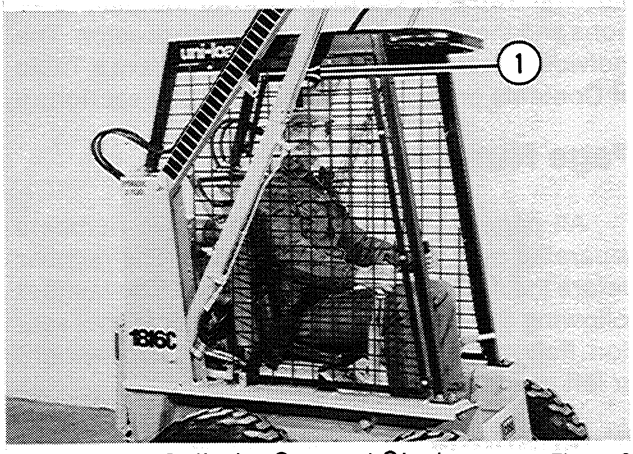


Figure 2

WARNING: *Operate controls from the operator's seat only.* 35-7

WARNING: *When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution.* 35-4

WARNING: *Whenever the bucket must be raised to aid in servicing, block the loader arms in place with lift cylinder support strut or a suitable safety stand.* 23-7-B



1. *Lift Cylinder Support Strut* Figure 3

WARNING: *When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure.* 47-44

WARNING: *When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way.* 47-45

WARNING: *Use insulated gloves or mittens when working with hot parts.* 47-41A

CAUTION: *Pin sized and smaller streams of hydraulic oil under pressure can penetrate the skin and result in serious infection. If hydraulic oil under pressure does penetrate the skin, seek medical treatment immediately. Maintain all hoses and tubes in good condition. Make sure all connections are tight. Make a replacement of any tube or hose that is damaged or thought to be damaged. DO NOT use your hand to check for leaks; use a piece of cardboard or wood.* 40-6-A

CAUTION: *When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer.* 46-17

CAUTION: *When using a hammer to remove and install pivot pins or separate parts, using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors).* 46-13

CAUTION: *When servicing or repairing the machine, keep the shop floor and operator's compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and/or shop cloths as required. Use safe practices at all times.* 40-8

CAUTION: *Use suitable floor (service) jacks or chain hoists to raise wheels or track off the floor. Always block machine in place with suitable safety stands.* 40-7-A

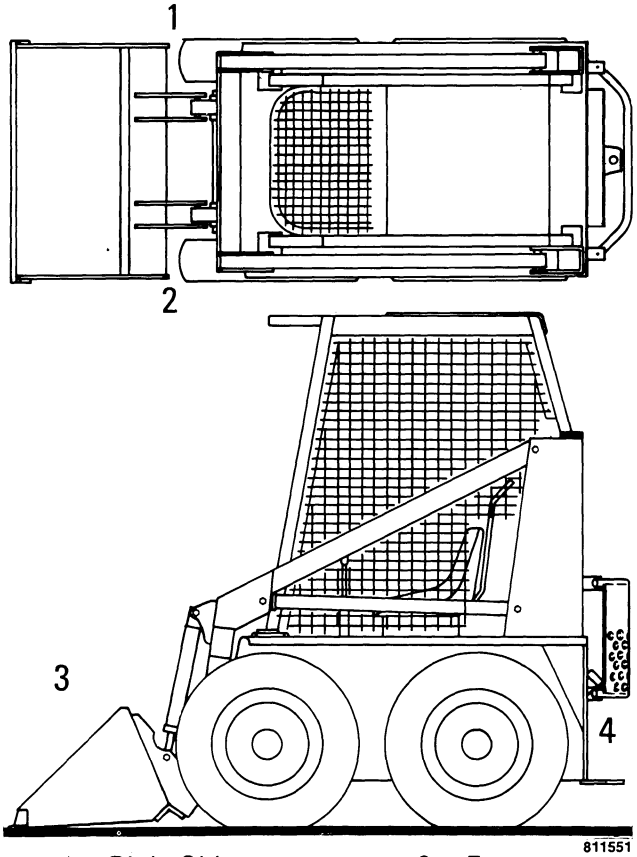
CAUTION: *Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in this service manual.* 40-10

SERVICE MANUAL INTRODUCTION

This service manual has been prepared with the latest service information available. Troubleshooting, removal, disassembly, inspection and installation procedures, and complete specifications and tightening references can be found in most sections. Some sections have drawings but no written procedure because the job is so easily done. This service manual is one of the most important tools available to the service technician.

Right, Left, Front, and Rear

The terms right-hand and left-hand and front and rear as used in this manual indicate the right and left sides, and front and rear of the machine as seen from the operator's seat for correct operation of the machine or attachment.



1. *Right Side*
2. *Left Side*
3. *Front*
4. *Rear*

Figure 4

Text

If the service manual is for more than one machine or different models of components (planetary axles, gear boxes, control valves, etc.) the procedures have the steps necessary to service each model.

Table of Contents

A Table of Contents is in the front of this manual. The Table of Contents shows the main divisions and the sections that are in each division. The individual sections, where necessary, have a Table of Contents on the second page of that section.

Page Numbers

All page numbers are made of two numbers separated by a dash, such as 4002-9. The number before the dash is the section number. The number following the dash is the page number in that section. Page numbers will be found at the upper right or left of each page.

Illustrations

Illustrations are put as near as possible to the text and are to be used as part of the text.

Classification of Lubricants

The SAE number is the viscosity of engine oils; for example, SAE 30, a single viscosity oil. SAE 10W30 is a variable viscosity oil.

The API classification (SD, CD, etc.) is the oil performance in terms of engine usage. Only oils specified in Section 1002 can be used. These oils have the needed chemical additives to give maximum engine protection. Both the SAE grade and API classification must be found on the container.

Special Tools

Special tools are needed to remove and install, disassemble and assemble, check and adjust some component parts of this machine. Some special tools can be easily made locally and the necessary information to make the tool is in this service manual. Other special tools are more difficult to make locally and are available from Service Tools in the U.S. and from Jobborn Manufacturing in Canada. Use these tools according to the instructions in this service manual for your personal safety and to do the job correctly.

Order special tools from either of the following companies:

Service Tools
P.O. Box 314
Owatonna, Minnesota 55060

Jobborn Manufacturing Co.
97 Frid Street
Hamilton, Ontario L8P 4M3
Canada

Product Identification Number (PIN) and Serial Numbers

NOTE 1: *1816 and 1816B - Engine serial number is on carburetor side of blower housing. ROPS serial number is above operators head at front of the ROPS.*

NOTE 2: *All models - Bucket serial number is on the back of the spillguard.*

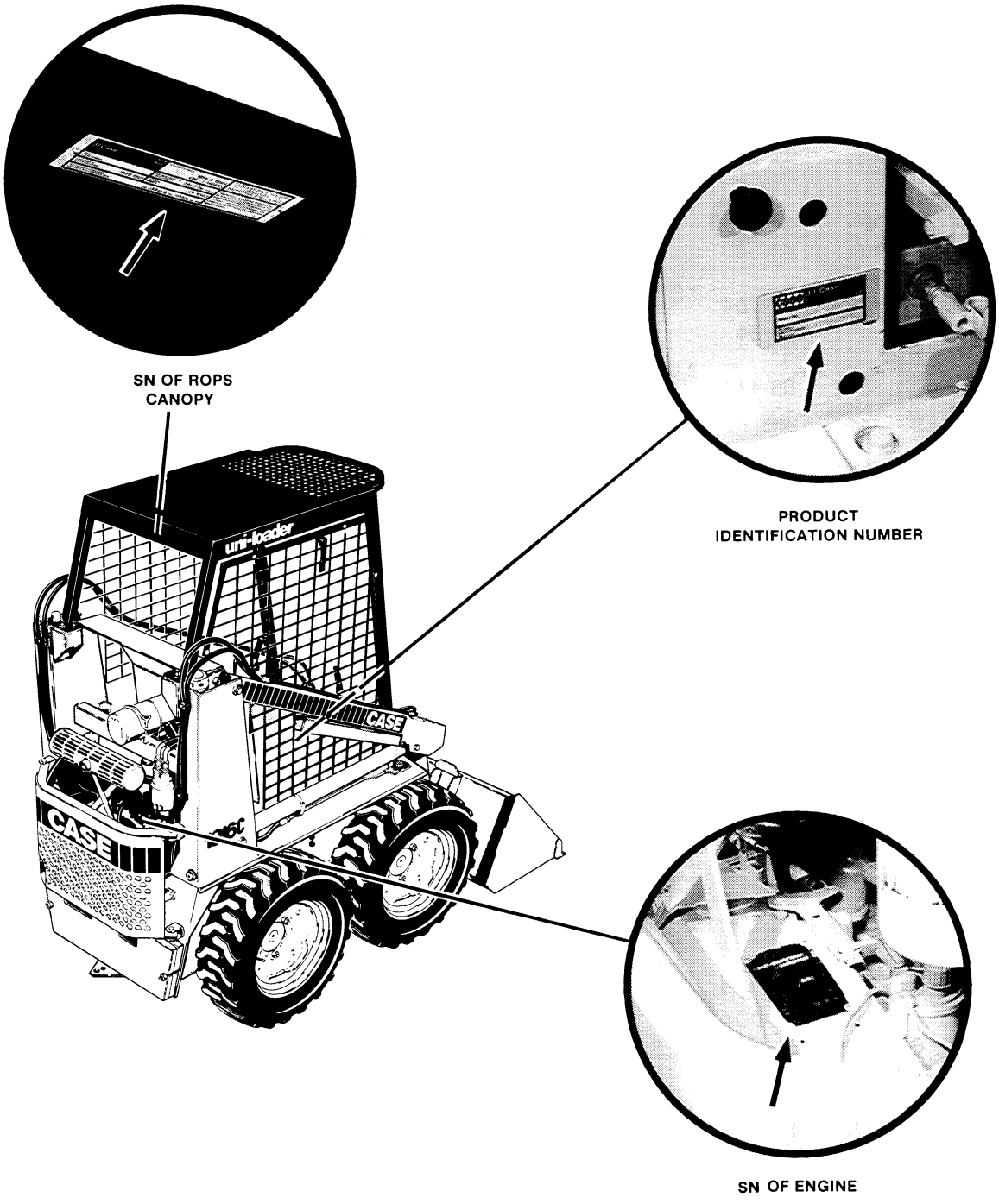


Figure 5 - 1816C Illustrated

TORQUE SPECIFICATIONS

(Use the following torques when special torques are not given.)

Grade 5 Bolts, Nuts and Studs (Dry Threads)

Thread size	Pound-Feet	Newton metres	Kilogram metres		Thread size	Pound-Feet	Newton metres	Kilogram metres
1/4-20 NC	5-10	7-14	0.7-1.4		3/4-10 NC	235-285	319-386	32.5-39.4
1/4-28 NF	10-15	14-20	1.4-2.1		3/4-16 NF	270-330	366-447	37.3-45.6
5/16-18 NC	15-20	20-27	2.1-2.8		7/8-9 NC	360-440	488-597	49.8-60.8
5/16-24 NF	15-20	20-27	2.1-2.8		7/8-14 NF	395-490	536-664	54.6-67.7
3/8-16 NC	25-35	34-47	3.5-4.8		1-8 NC	520-640	705-868	71.9-88.5
3/8-24 NF	30-40	41-54	4.1-5.5		1-12 NF	575-705	780-955	79.5-97.5
7/16-14 NC	45-55	61-75	6.2-7.6		1-1/8-7 NC	720-820	966-1112	99.5-113
7/16-20 NF	50-60	68-81	6.9-8.3		1-1/8-12 NF	790-970	1071-1315	109-134
1/2-13 NC	65-85	88-115	9.0-11.8		1-1/4-7 NC	1010-1240	1370-1681	140-171
1/2-20 NF	80-100	108-136	11.1-13.8		1-1/4-12 NF	1115-1365	1512-1851	154-189
9/16-12 NC	100-120	136-163	13.8-16.6		1-3/8-6 NC	1315-1610	1783-2183	182-223
9/16-18 NF	110-130	149-176	15.2-18.0		1-3/8-12 NF	1510-1850	2048-2509	209-256
5/8-11 NC	135-165	183-224	18.7-22.8		1-1/2-6 NC	1745-2135	2366-2895	241-295
5/8-18 NF	160-200	216-271	22.1-27.7		1-1/2-12 NF	1880-2420	2549-3282	260-335

Grade 8 Bolts, Nuts and Studs (Dry Threads)

Thread size	Pound-Feet	Newton metres	Kilogram metres		Thread size	Pound-Feet	Newton metres	Kilogram metres
1/4-20 NC	10-15	14-20	1.4-2.1		3/4-10 NC	340-420	461-570	47.0-58.1
1/4-28 NF	15-20	20-27	2.1-2.8		3/4-16 NF	380-460	515-623	52.5-63.6
5/16-18 NC	20-30	27-41	2.8-4.1		7/8-9 NC	540-660	732-895	74.7-91.2
5/16-24 NF	25-30	34-41	3.5-4.1		7/8-14 NF	595-725	807-983	82.3-100
3/8-16 NC	40-50	54-68	5.5-6.9		1-8 NC	810-990	1098-1342	112-137
3/8-24 NF	45-55	61-75	6.2-7.6		1-12 NF	900-1100	1220-1491	124-152
7/16-14 NC	60-80	81-108	8.3-11.1		1-1/8-7 NC	1150-1400	1559-1898	159-194
7/16-20 NF	70-90	95-122	9.7-12.4		1-1/8-12 NF	1295-1585	1756-2149	179-219
1/2-13 NC	100-120	136-163	13.8-16.6		1-1/4-7 NC	1640-2000	2224-2712	227-277
1/2-20 NF	110-130	149-176	15.2-18.0		1-1/4-12 NF	1800-2200	2441-2983	249-304
9/16-12 NC	135-165	183-224	18.7-22.8		1-3/8-6 NC	2140-2620	2902-3553	296-362
9/16-18 NF	155-190	210-258	21.4-26.3		1-3/8-12 NF	2450-3000	3322-4068	339-415
5/8-11 NC	200-240	271-325	27.7-33.2		1-1/2-6 NC	2845-3475	3858-4712	393-480
5/8-18 NF	215-265	292-359	29.7-36.6		1-1/2-12 NF	3200-3900	4339-5288	442-539

TORQUE SPECIFICATIONS FOR STEEL HYDRAULIC FITTINGS

Dash Size	Tube O.D. Hose I.D.	Thread Size	37 Degree Flare			Straight Thread With O-ring		
			Pound-Feet	Newton metres	Kilogram metres	Pound-Feet	Newton metres	Kilogram metres
4	1/4 in (6.4 mm)	7/16-20	6-12	8-16	0.8-1.6	12-19	16-26	1.6-2.6
5	5/16 in (7.9 mm)	1/2-20	8-16	11-22	1.1-2.2	16-25	22-34	2.2-3.4
6	3/8 in (9.5 mm)	9/16-18	10-25	14-34	1.4-3.4	25-40	34-54	3.4-5.5
8	1/2 in (12.7 mm)	3/4-16	15-42	20-57	2.1-5.8	42-67	57-91	5.8-9.3
10	5/8 in (15.9 mm)	7/8-14	25-58	34-79	3.4-8.0	58-92	79-125	8.0-12.7
12	3/4 in (19.0 mm)	1-1/16-12	40-80	54-108	5.5-11.0	80-128	108-174	11.0-17.7
14	7/8 in (22.2 mm)	1-3/16-12	60-100	81-136	8.3-13.8	100-160	136-217	13.8-22.1
16	1.0 in (25.4 mm)	1-5/16-12	75-117	102-159	10.4-16.2	117-187	159-254	16.2-25.9
20	1-1/4 in (31.8 mm)	1-5/8-12	125-165	169-224	17.3-22.8	165-264	224-358	22.8-36.4
24	1-1/2 in (38.1 mm)	1-7/8-12	210-250	285-339	29.0-34.6	250-400	339-542	34.6-55.3

Split Flange Mounting Bolts (Grade 5, Dry Threads)

Thread Size	Pound-Feet	Newton metres	Kilogram metres
5/16-18 NC	15-20	20-27	2.1-2.8
3/8-16 NC	20-25	27-34	2.8-3.5
7/16-14 NC	34-45	46-61	4.7-6.2
1/2-13 NC	55-65	75-88	7.6-9.0
5/8-11 NC	140-150	190-203	19.4-20.7

740314 C

NOTES

Section 1002

MAINTENANCE AND LUBRICATION

Written In *C*lear *A*nd *S*imple *E*nglish

CASE CORPORATION

8-41040
March 1982

PRINTED IN U.S.A.

FLUIDS AND LUBRICANTS

COMPONENT	CAPACITY		SPECIFICATIONS
	U.S.	Metric	
Fuel tank	8.5 gallons	32.2 litres	See the Operators Manual
Engine crankcase			Engine oil with API service classification of SE or SE/CC.
With filter change	2.3 quarts	2.2 litres	Above 32° F (0°) ..... SAE 30 or SAE 40 Below 32° F (0°) ..... SAE 10W-30 or SAE 10W-40
Without filter change	1.75 quarts	1.6 litres	Below 0° F (-18°) ..... SAE 5W-30 or SAE 5W-20
Hydraulic reservoir			SAE 10W-40 engine oil with API classification of SD or SE
With filter change	15 quarts	14.2 litres	
Without filter change	14 quarts	13.2 litres	
Grease fittings	As required		Case molydisulfide multipurpose grease
Battery	As required		Clean water or distilled water
Hydrostatic motor shaft splines	As required		Molykote, Type G grease, Case part number D60210

MAINTENANCE CHART

This chart shows maximum service intervals for the correct maintenance of the machine. Some working conditions will make it necessary to shorten the service intervals.

INTERVAL	SERVICE	INSTRUCTIONS
After the first two hours of operation, new machine only	Check the drive belt tensions. Tighten wheel nuts every two hours until the wheel nuts stay tight.	1816 - See Section 2003. 1816B and 1816C - See Section 6012. See Section 6014.
After the first 20 hours of operation, new machine only	Do the After Delivery Check.	See the Operators Manual.
After the first 50 hours of operation, new machine only	Check the engine valve clearance.	1816 and 1816B - See the Tecumseh manual. 1816C - See Section 2006.
Every five hours of operation or two times each day	Check the engine oil level.	
Every 10 hours of operation or each day, whichever occurs first	Clean the dust cup in the air cleaner. Make sure that the hydraulic oil cooler is clean. Check for damage. Check the hydraulic filter condition indicator. Lubricate the pivot points on the loader and the grapple. Clean or replace all safety and instruction decals that cannot be read. Check the tires for deep cuts and other damage. Visually check the machine for loose, broken, or missing parts. Check for oil leaks.	See Section 2007. See Section 8002. See Section 9004.
Every 25 hours or operation or two times each week	Change the engine oil. Tighten all hose clamps.	

(Continued on next page)

INTERVAL	SERVICE	INSTRUCTIONS
Every 50 hours of operation or each week, whichever occurs first	Check the electrolyte level in the battery.	See Section 4005.
	Check the pressure in the tires.	See Section 6014.
	Lubricate the control lever linkage.	
	Change the engine oil filter.	
	Check the hydraulic oil level.	See Section 8002.
	Clean the engine cooling fins.	
	Check the drive belt tensions.	1816 - See Section 2003. 1816B and 1816C - See Section 6012.
After every 100 hours of operation	Replace the spark plugs.	1816 and 1816B - See the Tecumseh manual. 1816C - See Section 2006.
	Check the condition of the breaker contact points.	1816 and 1816B - See the Tecumseh manual. 1816C - See Section 2006.
	Clean the spark arrester muffler (if equipped).	See Section 2007.
After every 200 hours of operation	Check the engine valve clearance.	1816 and 1816B - See the Tecumseh manual. 1816C - See Section 2006.
	Check the tension of the drive chains.	See Section 6013.
	Clean the engine breather mechanism.	1816 and 1816B - See the Tecumseh manual. 1816C - See Section 2006.
	Check the engine compression.	1816 and 1816B - See the Tecumseh manual. 1816C - See Section 2002.
Every 500 hours of operation of two times each year	Inspect the ROPS	See Section 9003.
Every 1000 hours of operation or one time each year	Lubricate the shaft splines on the hydrostatic motors.	See Section 6007.
	Replace the fuel filter and drain the fuel tank.	See Section 3001.
	Change the hydraulic oil.	See Section 8002.
	Clean the hydraulic reservoir breathers.	See Section 8002.
	Replace the air cleaner element.	See Section 2007.

INTERVAL	SERVICE	INSTRUCTIONS
As required	Replace the air cleaner element.	See Section 2007.
	Replace the fuel filter.	See Section 3001.
	Replace the hydraulic oil filter.	See Section 8002.
	Check the operation of the steering controls and adjust as required.	See Section 6008 or Section 6009.
	Clean the drive chains with a stiff brush and lubricate with SAE 30 engine oil.	See Section 6013.
	When you operate the machine in sand or severe dust conditions, check and clean the chain compartments each day.	
	Clean the machine.	

NOTES

Section
1003

ENGINE SPECIFICATIONS - 1816C

Written In *Clear And Simple English*

CASE CORPORATION

8-41040
March 1982

PRINTED IN U.S.A.

TABLE OF CONTENTS

SPECIFICATIONS

General

Engine Manufacturer ..... Onan

Type ..... 2 cylinder, 4 cycle, L-head

Bore ..... 3.249 - 3.250 inches (82.53 - 82.55 mm)

Stroke ..... 2.62 inches (66.5 mm)

Compression Ratio 6.6:1

Piston Displacement ..... 43.3 cubic inches (709.6 cm^3)

Engine Speeds

- Full Throttle - No Load ..... 3700 - 3800 rpm (r/min)
- Full Throttle - Full Load ..... 3600 rpm (r/min)
- Low Idle ..... 950 - 1050 rpm (r/min)

Valve Tappet Clearance (Cold)

- Intake ..... .008 inch (0.20 mm)
- Exhaust ..... .013 inch (0.33 mm)

Valve Rotators ..... positive type

Starter Gear to Ring Gear Backlash ..... .010 - .030 inch (0.25 - 0.76 mm)

Cylinder Sleeve

Type ..... cast into cylinder block

Material ..... pearlitic iron

ID of Cylinder Sleeve (Standard Size) ..... 3.249 to 3.250 inches (82.53 to 82.55 mm)

Maximum Permitted Out of Round ..... .002 inch (0.05 mm)

Maximum Permitted Taper ..... .005 inch (0.13 mm)

Piston Clearance (Measured .10 Inch (2.5 mm) Below Oil Control Ring, 90 Degrees From Piston Pin) ..... .004 to .006 inch (0.10 to 0.15 mm)

Piston

Type ..... die cast, wave ground

Material ..... eutectic aluminum alloy

Diameter ..... 3.243 - 3.244 inches (82.37 - 82.40 mm)

Ring Groove Width
- Number One Compression ..... .080 - .081 inch (2.03 - 2.06 mm)
- Number Two Compression ..... .080 - .081 inch (2.03 - 2.06 mm)
- Number Three Oil Control ..... .188 - .189 inch (4.78 - 4.80 mm)

Piston Rings

Number Per Piston ..... three

Number of Compression Rings ..... two

Number of Oil Control Rings ..... one

Number One Compression
- Type ..... molybdenum filled
- End Gap ..... .010 - .020 inch (0.25 - 0.51 mm)
- Side Clearance ..... .002 - .008 inch (0.051 - 0.203 mm)

Number Two Compression
- End Gap ..... .010 - .020 inch (0.25 - 0.51 mm)

Number Three Oil Control
- Type ..... two piece
- End Gap ..... .010 - .020 inch (0.25 - 0.51 mm)

Piston Pin

Type ..... full floating

Diameter ..... .687 - .688 inch (17.45 - 17.48 mm)

Fit in Piston ..... .0002 - .0004 inch (0.005 - 0.010 mm)

Fit in Connecting Rod ..... .0002 - .0007 inch (0.005 - 0.018 mm)

Connecting Rod

Material ..... aluminum alloy

Crankshaft to Connecting Rod Clearance ..... .002 - .003 inch (0.05 - 0.08 mm)

Side Clearance ..... .002 - .016 inch (0.05 - 0.41 mm)

Crankshaft

Type	balanced
Material	ductile iron, induction hardened main bearing journals
Main Bearing Journal (Standard Size)	1.999 - 2.000 inches (50.78 - 50.80 mm)
Connecting Rod Journal (Standard Size)	1.625 - 1.626 inch (41.28 - 41.30 mm)
Crankshaft to Main Bearing Clearance	.002 - .004 inch (0.05 - 0.10 mm)
Crankshaft End Play	.006 - .012 inch (0.15 - 0.30 mm)
Crankshaft Gear to Camshaft Gear Backlash	.002 - .003 inch (0.05 - 0.08 mm)

Main Bearing

Type	replaceable precision with thrust washer
Material	steel back aluminum
Length	one inch (25.4 mm)
Diameter (Standard Size)	2.001 - 2.004 inches (50.83 - 50.90 mm)

Camshaft

Material	cast iron alloy
Camshaft Lift	.300 inch (7.62 mm)
Camshaft End Play (Minimum)	.003 inch (0.08 mm)
Camshaft Journal Diameter	1.374 inch (34.90 mm)
Camshaft to Camshaft Bearing Clearance	.001 - .003 inch (0.04 - 0.08 mm)
Length of Center Pin Extension From Camshaft Gear	25/32 inch (19.8 mm)
Governor Cup Travel on Center Pin	7/32 inch (5.6 mm)

Camshaft Bearing

Number	two
Type	replaceable precision
Material	lead babbitt
Diameter	1.376 - 1.377 inch (34.95 - 34.98 mm)

Lubrication System

Type ..... Full pressure lubrication to main bearings, connecting rod bearings, and governor. Splash and jet spray lubrication to other parts.

Oil Capacity

With Filter Change ..... 2.3 quarts (2.2 litres)

Without Filter Change ..... 1.75 quarts (1.66 litres)

Oil Pressure ..... 30 psi (207 kPa) with engine warm and operating at rated engine speed

Oil Pump ..... positive displacement, gear

Oil Pump Gear to Crankshaft Gear Backlash ..... .002 - .005 inch (0.05 - 0.13 mm)

Valve Tappets

Type ..... mechanical, adjustable

Diameter (Standard) ..... .747 -.748 inch (18.99 - 19.00 mm)

Diameter of Bore for Valve Tappet ..... .750 - .751 inch (19.05 - 19.08 mm)

Exhaust Valve

Material ..... hard chrome-cobalt alloy

Valve Tappet Clearance (Cold) ..... .013 inch (0.33 mm)

Valve Face Angle ..... 44 degrees

OD of Head ..... 1.12 inch (28.4 mm)

OD of Valve Stem ..... .341 - .342 inch (8.66 - 8.69 mm)

Length ..... 4.73 inches (120.1 mm)

Valve Seat ..... replaceable

Valve Seat Contact Width ..... .031 - .047 inch (0.8 - 1.2 mm)

Valve Seat Angle ..... 45 degrees

Valve Stem to Valve Guide Clearance ..... .002 - .004 inch (0.05 - 0.10 mm)

Valve Guide ..... replaceable precision

ID of Valve Guide ..... .344 - .346 inch (8.74 - 8.79 mm)

Intake Valve

Material ..... aluminized austenitic alloy steel

Valve Tappet Clearance (Cold) ..... .008 inch (0.20 mm)

Valve Face Angle ..... 44 degrees

OD of Head ..... 1.30 inch (33.0 mm)

OD of Valve Stem ..... .342 - .343 inch (8.69 - 8.71 mm)

Length ..... 4.72 inches (119.9 mm)

Valve Seat ..... replaceable

Valve Seat Contact Width ..... .031 - .047 inch (0.8 - 1.2 mm)

Valve Seat Angle ..... 45 degrees

Valve Stem to Valve Guide Clearance ..... .001 - .002 inch (0.03 - 0.05 mm)

Valve Guide ..... replaceable precision with sealing gasket

ID of Valve Guide ..... .344 - .346 inch (8.74 - 8.79 mm)

Valve Springs

Free Length ..... 1.662 inch (42.21 mm)

Compressed Length ..... 1.375 inch (34.92 mm)

Spring Tension (Open) ..... 71 - 79 pounds (316 - 351 N)

Spring Tension (Closed) ..... 38 - 42 pounds (169 - 187 N)

Ignition

Contact Point Gap ..... .021 inch (0.53 mm)

Ignition Timing ..... 21 degrees before TDC

Spark Plugs
Case Part Number N7424

Champion Part Number RH18Y

Spark Plug Gap ..... .025 inch (0.64 mm)

Spark Plug Torque ..... 15 - 20 pound-feet (20 - 27 N m)

Fuel System

Carburetor ..... Walbro (LUA-14)

SPECIAL TORQUES

	Pound-Feet	Newton-Metres
Gear Cover Cap Screws	8 - 10	11 - 14
Cylinder Head Cap Screws (See Section 2006 for Correct Procedure	15	20
Rear Bearing Plate Cap Screws	25 - 27	34 - 37
Starter Mounting Cap Screws	18 - 20	24 - 27
Connecting Rod Nuts	12 - 14	16 - 19
Flywheel Cap Screw	35 - 40	48 - 54
Other 5/16 Inch Cylinder Block Studs and Nuts	8 - 10	11 - 14
Oil Base Cap Screws	18 - 23	24 - 31
Intake Manifold Cap Screws	6 - 10	8 - 14
Oil Pump Mounting Cap Screws	7 - 9	10 - 12
Valve Cover Cap Screws	1 - 2	1.3 - 2.7
Exhaust Manifold Cap Screws	9 - 11	12 - 15
Adapter Plate to Carburetor Cap Screws	5 - 7	7 - 9
Oil Filter Adapter Cap Screws	13 - 15	18 - 20
Allen Head Screws Which Fasten Contact Point Assembly to Engine	6 - 8	8 - 11
Spark Plugs	15 - 20	20 - 27

Section
2001

ENGINE TROUBLESHOOTING - 1816 AND 1816B

CASE CORPORATION

8-41040
March 1982

PRINTED IN U.S.A.

ENGINE TROUBLESHOOTING

1. Check for causes of hard starting as instructed under Troubleshooting in the Tecumseh Engines Mechanic's Handbook. If cause of trouble is not located, proceed to step 2.

2. Check and adjust valve clearance as instructed in the Tecumseh Engines Mechanic's Handbook. The engine MUST be cold. If valve adjustment did not correct the problem, proceed to step 3.

3. Check for proper compression relief operation.

   a. Position piston at TDC on the compression stroke.

   b. Position a dial indicator on top of the EXHAUST valve adjusting screw.

   c. Turn the engine backward one half revolution.

   d. Turn engine forward through the compression stroke while holding the exhaust valve rocker arm firmly against the push rod and observe the dial indicator. A minimum of .030 inch (0.76 mm) lift should be measured by the dial indicator.

   e. If lift is less than .030 inch (0.76 mm), the relief mechanism on the camshaft is defective and the camshaft must be replaced. The cause could be a worn relief pin or broken counterweight spring, Figure 1.

4. Make sure all battery cable connections are tight and free of corrosion and oxidation. Also check to make sure battery is not defective.

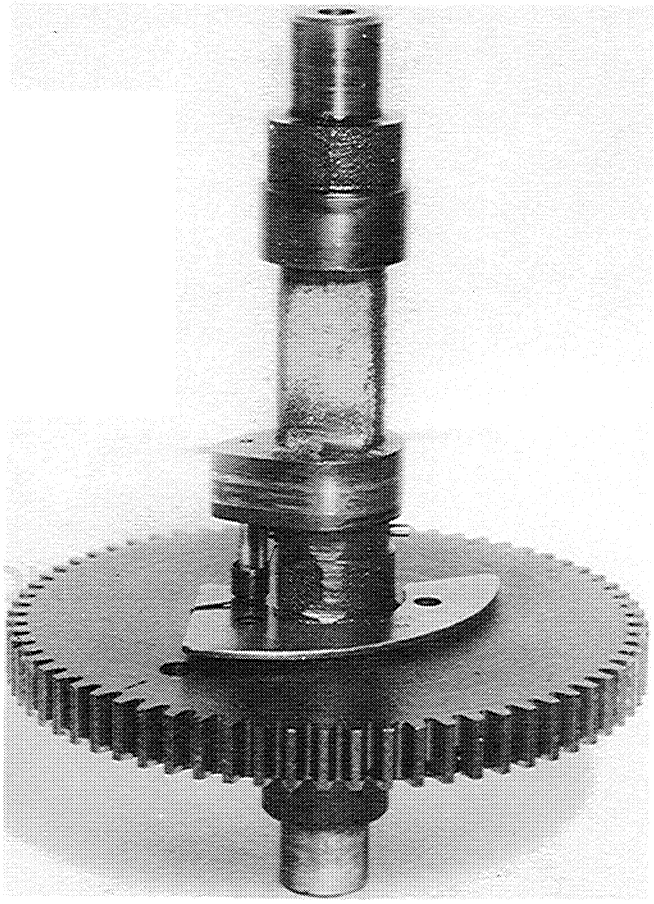


Figure 1 - Camshaft

5. If machine is equipped with a starter button, it is suggested that it be replaced with a starter switch. Switch and installation instructions are available in Kit D61884.

Section

2002

ENGINE TROUBLESHOOTING - 1816C

Written In *Clear And Simple English*

CASE CORPORATION

8-41040
March 1982

PRINTED IN U.S.A.

TABLE OF CONTENTS

Below is a list of common problems with possible causes and corrections.

ENGINE DOES NOT START OR IS DIFFICULT TO START

POSSIBLE CAUSE	CORRECTION
No fuel in fuel tank.	Fill fuel tank with clean fuel.
Obstruction in vent in fuel filler cap.	Clean vent in fuel filler cap.
Obstruction in fuel line.	Clean fuel filter and fuel line. If necessary, remove and clean carburetor.
Water in fuel.	Drain fuel tank. Clean carburetor and fuel lines. Clean spark plug electrodes. Fill fuel tank with clean fuel
Carburetor adjustment is not correct.	Adjust carburetor. See Section 3002.
Loose or damaged wiring.	Check wiring for short circuits or grounds. Repair as necessary.
Defect in ignition system.	Check and repair ignition system. See Section 4002.
Foreign material on spark plug electrode.	Clean spark plug and check spark plug gap.
Spark plug insulator damaged.	Replace spark plug.
Poor compression.	Check compression. Correct compression is approximately 100 psi (689 kPa). Both cylinders must be approximately the same.
No spark at spark plug.	See Section 4002.
Starter does not turn engine.	See Section 4006.

KNOCK IN ENGINE

POSSIBLE CAUSE	CORRECTION
Carbon in combustion chamber.	Remove cylinder head and clean carbon from cylinder head and piston.
Loose or worn connecting rod.	Replace connecting rod.
Loose flywheel.	Check flywheel key and keyway. Replace parts if necessary. Tighten flywheel cap screw to correct torque (See Section 1003).

POSSIBLE CAUSE	CORRECTION
Worn cylinder.	Repair or replace as necessary.
Ignition timing is not correct.	Check contact points and ignition timing.
Too much crankshaft end play.	Install shims to get correct crankshaft end play.

IGNITION IS ERRATIC WHEN ENGINE IS UNDER LOAD

POSSIBLE CAUSE	CORRECTION
Foreign material on spark plug electrode.	Clean spark plug and check spark plug gap.
Spark plug insulator damaged.	Replace spark plug.
Spark plug gap not correct.	Adjust spark plug gap.
Ignition contact points have pitting.	Clean and adjust contact points. Replace contact points if pitting is severe.
Breaker arm does not operate freely.	Clean and lubricate breaker box plunger and breaker arm. Check for spring tension.
Bad condenser.	Replace condenser.
Carburetor adjustment is not correct.	Adjust carburetor. See Section 3002.
Valve clearance is not correct.	Adjust valve clearance.
Weak valve spring.	Replace valve spring.

ENGINE POWER IS LOW

POSSIBLE CAUSE	CORRECTION
Choke is not open all the way.	Open choke.
Carburetor adjustment is not correct.	Adjust carburetor. See Section 3002.
Ignition timing is not correct.	Check contact points and ignition timing.