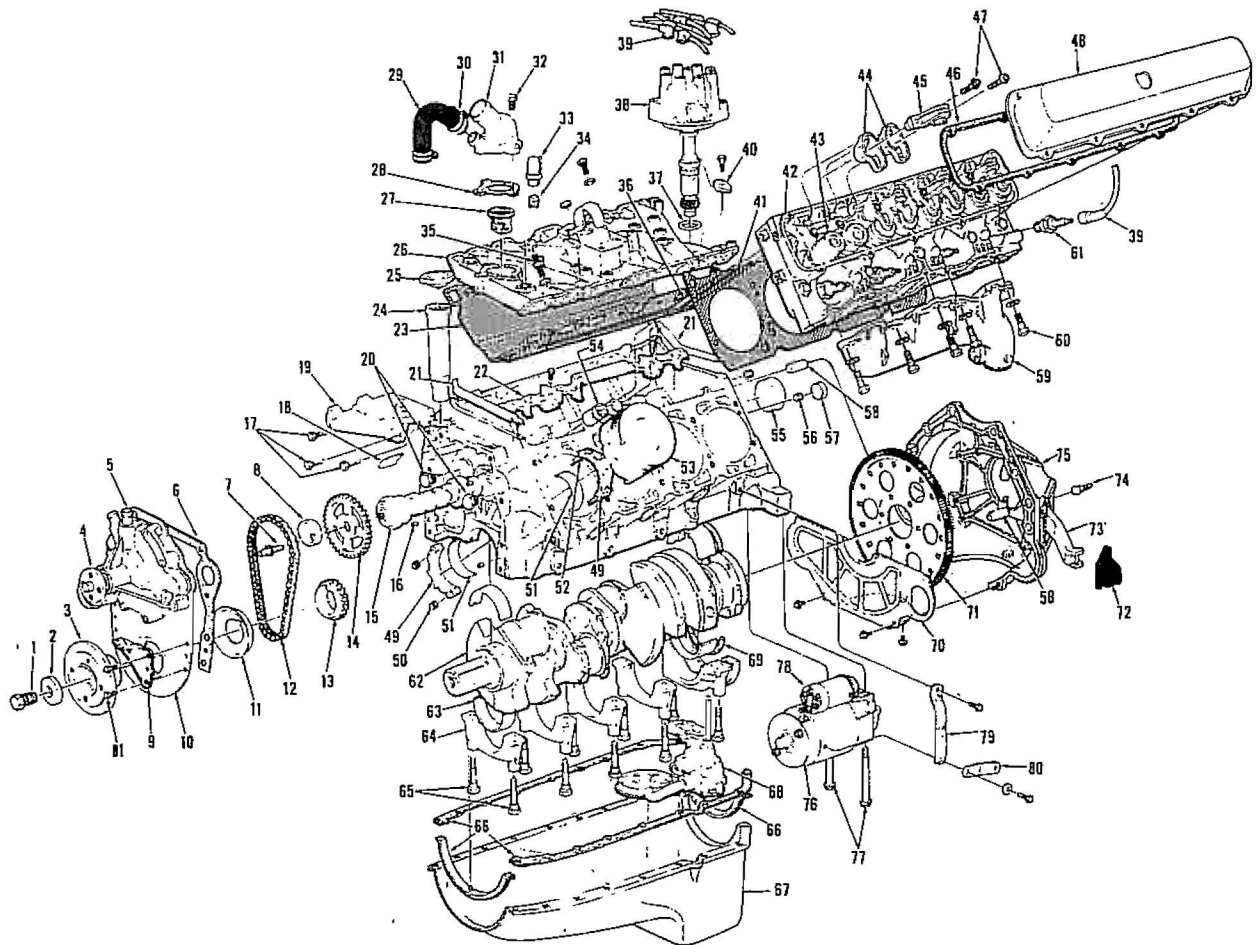


1971

OLDSMOBILE



Engine Assembly Manual

Drawings and Parts Lists
covering the assembly of
Olds 350 and 455 V8s

CHART INDEX

1971

PAGE NO.	DESCRIPTION
1	ENGINE IN SERIES USAGE
2	CYLINDER BLOCKS
3	CYLINDER HEADS
4	EXHAUST EMISSIONS LABELS
5	CRANKSHAFTS
6	BALANCER ASMS. & TIMING INDICATOR
7	PISTONS
8-8A-8B-8C-8D	PISTON RINGS
9	OIL PANS
10	OIL PUMP ASMS.
11	OIL LEVEL GUIDES & STICKS
12	WATER PUMPS - W/P BEARINGS & IMPELLERS
13	FAN BLADE ASMS.
14	FAN CLUTCHES
15	INTAKE MANIFOLDS
16	EXHAUST MANIFOLDS
17	EXHAUST MANIFOLD SHROUDS
18	CARBURETORS
19	CHOKE AIR PIPES
20	AIR CLEANERS
21	AIR CLEANER LABELS
22	FUEL PUMPS
23	FUEL PIPES
24	AIR CLNR STUDS-WATER BY-PASS HOSES
25A-25B	CAMSHAFTS
26	PUSH RODS
27	TIMING CHAIN & SPROCKETS
28	VALVE LIFTERS
29	VALVES - INTAKE & EXHAUST

CHART INDEX

PAGE NO.	DESCRIPTION
30	VALVE SPRINGS
31	STARTER MOTORS
32	IGNITION COILS
33	DISTRIBUTORS
34	SPARK PLUGS
35	SPARK PLUG WIRES
36	CAST ACCESSORY MTG. BRACKETS
37	DIST. VAC. SWITCH & DASHPOT
38A-38B	MAIN BEARINGS
39	CONNECTING ROD BEARINGS
40	GENERATORS
41	A/C COMPRESSORS

1971 PRODUCTION CYLINDER BLOCKS

CASTING	BLOCK	BLOCK ASH	ENGINE USAGE	BORE SIZE	DECK HEIGHT	IDENTIFICATION	REMARKS
395558	395558	400428 *	654	<u>4.056</u>	<u>9.335</u> 9.325	CAST FIGURE "2" AND CAST P.N. 395558	
		400427 @		4.058			
396021F	396021F	399774 *	657 659 EXC W30	<u>4.125</u>	<u>10.630</u> 10.620	CAST LETTER "G" AND CAST P.N. 396021 COLOR CODE FRT & RR BRONZE	
		399776 *	664	4.127			STUD END BOLTS IN #1 & #4 BEARING CAPS
		406454 *	W30	<u>4.1265</u> 4.1270			SPECIAL BORE SELECTION

1971 PRODUCTION CYLINDER HEADS

ASTING	HEAD	HEAD SUB ASM	HEAD ASM	ENGINE USAGE	IDENTIFICATION		HEAD VOL CC	INT PORT AREA	VALVE SEAT			
					CAST	COLOR			INTAKE		EXHAUST	
									DIA	ANGLE	DIA	ANGLE
69147	409147	—	409386	654	1 RIB AT END OF HEAD #7	YELLOW	63.92	206	1.875	45°	1.562	45°
			409388	654 488L SM		PINK						
G 409100	409100	—	409390	657	G	RED	79.00	2.40	2.00	45°	1.625	45°
	409159	409361	409389	659 ETC W30 664 MARINE ALL IRRIGATION		BLUE	78.59		2.062	30°		
H 409160	409160	409362			2 RIBS AT END OF HEAD	SILVER						
			409392	W30	H							

EMISSIONS - CARB - EMISSIONS LABELS

ART NO	CODE	ENGINE	CARB	TRANS	ENGINE CODE	USAGE	REMARKS
994010	AN	250	1BBL	SM-AT	ZB-ZG	LL 'A'	CHEVY LABEL
109502	OA	350	2BBL	SM-AT	QA-QJ-QI TC-TD-TE	A & B BODY	
109503	OB	350	4BBL	SM-AT	QB-QN-QP-QO	A BODY	
109505	OD	455	4BBL	SM-AT	TA-TN-TU-TW	-442-	
109506	OE	455	4BBL	SM-AT	TB-TS-TT	A & W30	
109507	OF	455	2BBL	AT	TY-TX-UC-UD	A & B BODY	
109508	OG	455	4BBL	AT	UN-UO TQ-TP	A-B & C	
109517	OH	455	4BBL	AT	US-UT	TORO	
109913	OK	455	4BBL	AT	TV	442 AT C60	
109912	OL	455	4BBL	AT	TL	W30 C60 (A/C)	
109906	OJ	455	2BBL	SM	UE	'B' BODY	

ON

UV UW - Late toro

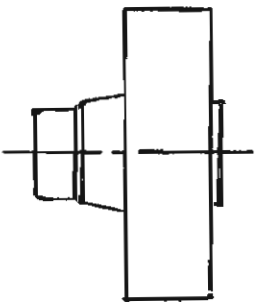
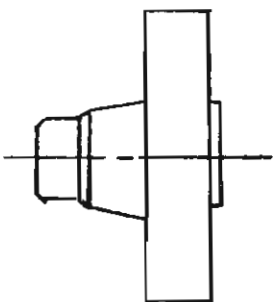
1971 PRODUCTION CRANKSHAFTS

STROKE	JOURNAL DIA	CRANKPIN DIA	C/S	C/S ASM	TRANS	ENGINE	REMARKS
385	#2-3-4-5		405348 *	405347	S.M	654	SINGLE POLISH
	<u>2.4995</u>	<u>2.1248</u>					
	2.4995	2.1238					
	#1 <u>2.4998</u>		405350 *	NONE	A.T		
4.250			406451 #	406452	S.M.	659	DOUBLE POLISH
			405363 #	NONE	A.T		
	<u>2.9993</u>	<u>2.4988</u>				657 664	SINGLE POLISH
	3.0003	2.4998	405361 #	NONE	A.T		
			405359 #	405358	S.M		

* MAKE FROM CASTING 393654

MAKE FROM CASTING 397363

1971 PRODUCTION BALANCER ASMS & TIMING INDICATOR

CATOR	PART NO		BAL ASM TUNING SPEC.	ENGINE USAGE	PROFILE
	HUB	WEIGHT			
13902	398263	409220	409219 1550-1750	654	
		400134	406541 1600-1800	657 659 664	

1971 PRODUCTION PISTONS

PISTON LISTING	PISTON	SIZE	DISH SIZE & DISP'L	IDENTIFICATION	COMP	ENGINE USAGE	PIN OFFSET	DIA
19074	409074	STD	235 x 2.910	(1) RND NOTCH	8.1:1	654	<u>.055</u> .065	<u>4.05675</u> 4.05475
	409172	.010 O.S	24.65 CC					
19112	409112	STD	344 x 3.027	(2) RND NOTCHES	8.1:1	657	<u>.055</u> .065	<u>4.1255</u> 4.1235
	409173	.010 O.S	39.53 CC			659		
18666	398666	STD	.143 x 2.93	(1) V NOTCH	9.75:1	664		
	400413	.010 O.S	14.80 CC			MARINE & IRRIGATION		

1971 PRODUCTION PISTON RING SOURCES & SIZES

ENGINE & DISPLACEMENT	SOURCE	STD	O.S	REMARKS
654 350 C.I.D	S.P.	X	X	
	P.C	X	NONE	
	MUSK.	X	X	
659 (442) 455 C.I.D				SAME SET AS 657 & 664 EXCEPT FOR CHROMED LWR COMP RING
	MUSK.	X	NONE	
657-664 455 C.I.D	S.P	X	X	
	HASTINGS	X	X	
	MUSK	X	X	

1971 PRODUCTION PISTON RINGS

ENGINE AND BORE SIZE	SOURCE	NAME	SIZE	PART NO.	IDENTIFICATION	
					COLOR	VENDOR
350 (634) 4.057	SEALED POWER	UPPER	STANDARD	399561	(1) BLUE STRIPE	"PIP" MARK
			.010 O.S.	399562	(2) BLUE STRIPE	
		LOWER	STANDARD	399563	(1) BLUE STRIPE	
			.010 O.S.	399564	(2) BLUE STRIPE	
		RAIL	STANDARD	399565	(1) BLUE STRIPE	NONE
			.010 O.S.	399566	(2) BLUE STRIPE	
		SPACER	STANDARD & .010 O.S.	399567	(1) BLUE & (1) GREEN	
	PERFECT CIRCLE	UPPER	STANDARD	399367	(1) PINK STRIPE	" _ " MARK
		LOWER	STANDARD	399370	(1) PINK STRIPE	
		RAIL	STANDARD	399371	(1) PINK STRIPE	NONE
		SPACER	STANDARD & .010 O.S.	399377	(1) PINK & (1) GREEN	

1971 PRODUCTION PISTON RINGS

ENGINE & BORE SIZE	SOURCE	NAME	SIZE	PART NO.	IDENTIFICATION	
					COLOR	VENDOR
350 (634) (4.057)	MUSKEGON	UPPER	STANDARD	404995	(1) RED STRIPE	MARK "O"
			.010 O.S.	404996	(2) RED STRIPES	
		LOWER	STANDARD	404999	(1) RED STRIPE	
			.010 O.S.	405000	(2) RED STRIPES	
		RAIL	STANDARD	405003	(1) RED STRIPE	NONE
			.010 O.S.	405004	(2) RED STRIPES	
		SPACER	STD. & .010 O.S.	405007	(1) GREEN & (1) RED	

1971 PRODUCTION PISTON RINGS

ENGINE AND BORE SIZE	SOURCE	NAME	SIZE	PART NO.	IDENTIFICATION	
					COLOR	VENDOR
657 664 (455 - 4.125)	SEALED POWER	UPPER	STANDARD	401980	(1) WHITE STRIPE	"PIP" MARK
			.010 O.S.	401983	(2) WHITE STRIPE	
		LOWER	STANDARD	401979	(1) WHITE STRIPE	
			.010 O.S.	401982	(2) WHITE STRIPE	
		RAIL	STANDARD	401978	(1) WHITE STRIPE	NONE
			.010 O.S.	401981	(2) WHITE STRIPE	
		SPACER	STANDARD & .010 O.S.	401977	(1) WHITE & (1) BLUE	
		UPPER	STANDARD	399383	(1) YELLOW STRIPE	MARK "O"
			.010 O.S.	399478	(1) YELLOW & (1) BLUE	
657 659 ✓ 664 (455 - 4.125)	MUSKEGON	LOWER	STANDARD	399384 404039-442	(1) YELLOW	
					(1) GREEN	
			.010 O.S.	399479	(1) YELLOW & (1) BLUE	
		RAIL	STANDARD	583187	(1) YELLOW	NONE
			.010 O.S.	382199	(1) YELLOW & (1) BLUE	
		SPACER	STANDARD & .010 O.S.	583188	(1) YELLOW & (1) BLUE	

NOTE: O.S. Rings are not used on any 442 (659) engines.

1971 PRODUCTION PISTON RINGS

ENGINE USAGE	BORE SIZE	SOURCE	NAME	SIZE	PART NO.	IDENTIFICATION	
						COLOR	VENDOR
657	4.125	HASTINGS	UPPER COMPRESSION	STANDARD	405483	(1) BROWN STRIPE	(2) "PIP" MARKS
				.010 O.S.	405557	(2) BROWN STRIPES	
			LOWER COMPRESSION	STANDARD	405484	(1) BROWN STRIPE	
				.010 O.S.	405538	(2) BROWN STRIPES	
			RAIL	STANDARD	399232	(1) BROWN STRIPE	NONE
				.010 O.S.	405559	(2) BROWN STRIPES	
			SPACER	STANDARD	399233	(1) BROWN & (1) WHITE	
				.010 O.S.	405576	(2) BROWN & (1) WHITE	

1971 PRODUCTION OIL PANS

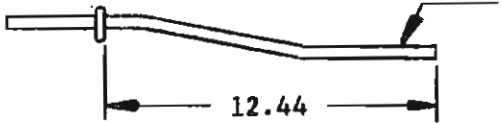
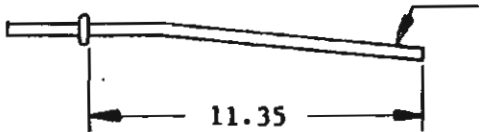
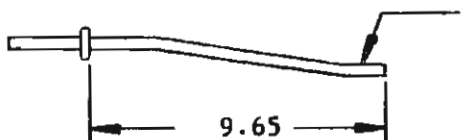
PAN ASSEMBLY	PAN	BAFFLE	OIL CAPACITY	ENGINE USAGE	PAN PROFILE
391440	391441	NONE	4 QTS.	654	
<u>407087</u>	<u>407088</u>	387462	4 QTS.	<u>657-659</u>	
398438	398439	391034	5 QTS.	664	

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1971 PRODUCTION OIL PUMP ASSEMBLIES

ENGINE USAGE	PUMP ASSEMBLY	SCREEN ASSEMBLY	RELIEF SPRING	
654 657 659	402386	402387	401366	
664	401365	389798		

1971 PRODUCTION OIL LEVEL GUIDES

PART NO.	ENGINE USAGE	IDENTIFICATION
400712	664	
401357	657 659	
401568	654	

Indicator 400714 used on 657-659-664.

Indicator 401567 used on 654.

1971 WATER PUMPS

USAGE	SHOP ASM	BODY ASM	BODY	IMPELLER	BEARING	HUB
9-4-E CAR STD	408390	408393	408328 (I.D. FIG. 1")	403036	907952	588041 OR 383763
7-4-C CAR STD <u>W30 *</u>	408391	408394	408329 (I.D. FIG 2)	403036	908043	587263 OR
9-B-C-E A/C OR Y72	408392	407535	407536 (I.D FIG 3)	404563	908062	399394

1771 PRODUCTION FANS

PART NO	FAN DIA	PITCH	NO OF BLADES	ENGINE USAGE		IDENTIFICATION
405442	19.00	2.25	4	654	STD	NONE
405443	19.50	2.25	4	657 659	STD	"443" STAMPED ON BLADE
409109	19.00	2.25	5	664	STD	NONE
409740	19.50	2.00	6	654 B (659)	A/C/Y72 W30, A/C/Y72	"740" STAMPED ON BLADE
407999	19.00	2.125	7	664	A/C/Y72	NONE
405762	19.50	2.25	6	654 A 657	A/C/Y72	NONE

1971 PRODUCTION FAN CLUTCHES

PART NO	CODE	HUB LENGTH	VISCOSITY (CENTISTOKES)	HUB RUNOUT (T.I.R)	FULL ENGAGE TEMP	USAGE
408228	OY	1.38	5000Y	.004	175°-190°	A/C 654 B & 657 Y72 654 & 657
4950788	OS	1.38	5000Y	.005	175°-190°	A/C ALL EXC 654A & 664 Y72 ALL EXC 664
4964317	OC	1.38	4000Y	.005	185°-200°	664 A/C OR Y72
4949861	OR	1.38	3000	.008	175°-190°	W30 NON AIR
410137	OA	1.38	3000Y	.004	175°-190°	654 A' A/C
4964303	OB					

OPTIONAL WITH 4950788

REVISED 1-13-71

PAGE 14

1971 PRODUCTION INTAKE MANIFOLDS

PART NO	ENGINE USAGE	BRANCH AREA	IDENTIFICATION	REMARKS
407564	654-2BBL	1.70 SQ. IN.	CAST FIGURE 11	
407565	654-4BBL	2.25 SQ. IN.	" " 12	
407566	657-2BBL	2.20 SQ. IN.	" LETTER P	
407567	657-4BBL ME (659)-4BBL A.T	2.50 SQ. IN.	" " R	
407568	659-4BBL SM	2.50 SQ. IN.	" " R	DIFFERS FROM 407567 BY HOLE FOR DUAL VENT NIPPLE
407569	664-4BBL	2.60 SQ. IN.	" " M	
407570	W30	2.50 SQ. IN.	" W455 A	CAST ALUMINUM

1971 PRODUCTION EXHAUST MANIFOLDS

CASTING	MANIFOLD	MANIFOLD ASM.	SIDE	IDENTIFICATION (CASTING PART NO. PLUS THE FOLLOWING)	ENGINE USAGE
398704	398704	-----	R.H.	CAST FIGURE "4"	654 ALL
380001	403453	-----	L.H.	CAST FIGURE "4"	654 "A" & "B"
398708	398708	-----	R.H.	CAST LETTER "T"	657 "B/C"
406301	406301	-----	L.H.	CAST LETTER "X"	657 "B/C"
402294	402294	-----	R.H.	CAST LETTER "Z"	657 "A" 659
402295	406197	-----	L.H.	CAST LETTER "W"	
395752	395752	-----	R.H.	CAST LETTER "G"	664
407103	407103	-----	L.H.	CAST LETTER "J"	

1974 PRODUCTION EXHAUST MANIFOLD SHROUDS

ENGINE USAGE	COVER PART NO.	SHROUD PART NO.	SHORUD ASM PART NO.	IDENTIFICATION
654 A	399426	406312	406312	FIGURE "4"
654 B	406317	406316	406315	LETTER "B"
657 A 659	402532	402531	402530	NONE
657 B/C	406320	406319	406318	LETTER "T"
664	399439	406324	406321	LETTER "H"

1971 PRODUCTION CARBURETORS

TYPE	ENGINE USAGE	PART NO	S.M	A.T		ASM CODE	IDENTIFICATION	
							COLOR CODE	OTHER
2BBL	654	7041155	X			NA		PART NUMBER AND CODE STAMPED ON LEFT RR SIDE OF 4 BBL'S & RT. FRT SIDE OF 2BB.
		7041156		X		NB		
	657	7041159	X	X		RB		
4BBL	654	7041250	X	X		NC		
	657	7041251		X		RC		
	(659)	7041257		(X)		RG		
		7041258	X			RE		
	664	7041252		X		RD		

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1970 CHOKE PIPES

PART NO.	NAME	ENGINE USAGE
406054	PIPE ASM. - CHOKE HOT AIR	TORO
406221	PIPE ASM. - CHOKE HOT AIR	657 4 BBL. - 659 8.M.
407016	PIPE ASM. - CHOKE HOT AIR	(659) A.T.
406220	PIPE ASM. - CHOKE HOT AIR	654 4 BBL
391993	PIPE ASM. - CHOKE HOT AIR	657 2 BBL
403930	PIPE ASM. - CHOKE HOT AIR	654 2 BBL
408486	PIPE - CHOKE CLEAN AIR	654 2 BBL
408487	PIPE - CHOKE CLEAN AIR	654 4 BBL
408488	PIPE - CHOKE CLEAN AIR	657 2 BBL
408489	PIPE - CHOKE CLEAN AIR	657 4 BBL - (659)
408490	PIPE - CHOKE CLEAN AIR	TORO

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1971 PRODUCTION AIR CLEANERS

PART NO	ASM CODE	COLOR	BODY O.D	USAGE	REMARKS
6484801	00	BLACK	15.50	ALL 2 BBL	SINGLE SNORKEL TO RIGHT SIDE
6486276	01	"	16 16	654 4 BBL 657 4 BBL	SINGLE SNORKEL TO RIGHT SIDE
6486966	ND	"	16 16	<u>442</u> EXC W30	DUAL SNORKEL
6487011	NE	"	16 16	TORO	SINGLE SNORKEL COLD AIR TYPE TO LEFT SIDE
6486695	NA	"	16 16	W30, W25	HOOD AIR TYPE

1971 PRODUCTION AIR CLEANER LABELS

ENGINE (C.I.D.)	CARBURETOR	PART NO.	REMARKS
250 L6	1 BBL	393061	SELF ADHESIVE
350	2 BBL	403609	SELF ADHESIVE
350	4 BBL	403610	SELF ADHESIVE
455	442	403613	SELF ADHESIVE
455	2 BBL	403611	SELF ADHESIVE
455	4 BBL	403612	SELF ADHESIVE
455	TORO	407092	CLAMP ON

1971 PRODUCTION FUEL PUMPS

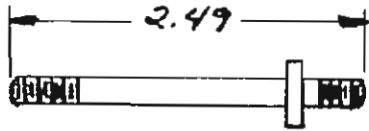
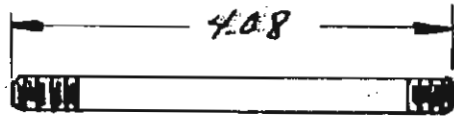
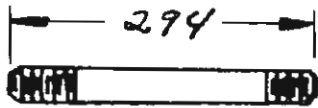
PART NO	ENGINE USAGE	PUMP PRESSURE	REMARKS	IDENTIFICATION
6440713	654 ALL	5.50-6.50 PSI	SURGE DOME (SMALL) NO FUEL BY-PASS	COMPLETE PART NO. OR LAST FIVE DIGITS OF PART NO. STAMPED ON MOUNTING FLANGE
6440711	657 B-C EXC A/C 657 A 28BL EXC A/C W30 (659)	"	SURGE DOME (LARGE) NO FUEL BY-PASS	
6440712	659 EXC W30 657 A A/C 28BL 657 A 48BL ALL 657 B-C A/C 664 ALL	"	SURGE DOME (LARGE) AND FUEL BY-PASS	

FUEL BY-PASS ON 350 ENGINES
CANCELED 12-22-70

1971 PRODUCTION FUEL PIPES

PART NO.	DESCRIPTION	ENGINE USAGE	IDENTIFICATION
405996	FUEL PUMP TO CARBURETOR	654 - 2 BBL.	WHITE PAINT DAUB
405997	FUEL PUMP TO CARBURETOR	654 - 4 BBL.	WHITE PAINT DAUB
405998	FUEL PUMP TO CARBURETOR	657 - 2 BBL.	NONE
406000	FUEL PUMP TO CARBURETOR	657 - 4 BBL. 659 - 4 BBL. EXC W30	NONE
409705	FUEL PUMP TO CARBURETOR	664	NONE
409702	FUEL PUMP TO FILTER	W30 (659)	NONE
409703	FILTER TO CARB.		

1971 PRODUCTION AIR CLEANER STUDS & WATER BY-PASS HOSES

PART NAME	PART NO	ENGINE USAGE	REMARKS
STUD-AIR CLEANER	400054	ALL 2BBL	
	400055	654 657 659 } 4BBL	
	400056	664	
HOSE-WATER BY-PASS	409041	654	STRAIGHT HOSE 2.00 LONG
	409042	657 659 664	STRAIGHT HOSE 3.00 LONG

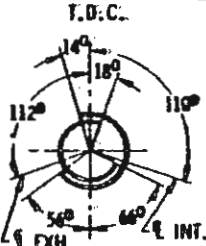
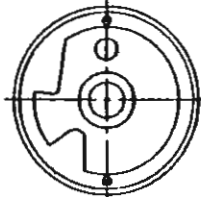
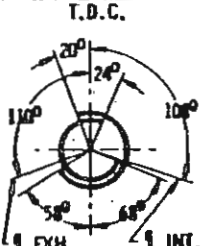
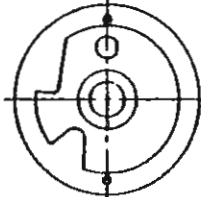
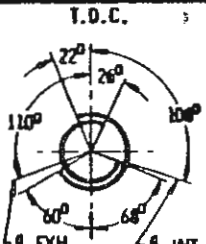
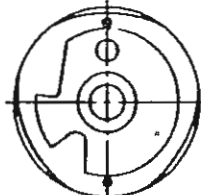
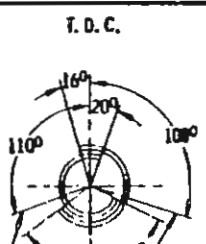
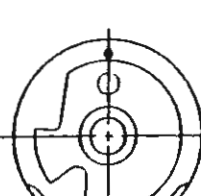
GENERAL MOTORS CORPORATION
 LANSING 11, MICHIGAN

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OLDSMOBILE DIVISION

GENERAL MOTORS CORPORATION
LANSING 21, MICHIGAN

1971 PRODUCTION CAMSHAFTS									
CAMSHAFT ASM	CAMSHAFT	INDEX	ENGINE USAGE	VALVE LIFT	VALVE TIMING	CAMSHAFT IDENTIFICATION		CASTING	
						SHAFT GRIND	COLOR CODE	IDENT.	PART NO.
409717	409718	2CZ	654 "B" CAR	INT. .400 EXH. .400	T.D.C. 		Ⓑ Ⓒ ONE BLUE STRIPE	NONE	401348
400117	400118	2AF	657	INT. .435 EXH. .435	T.D.C. 		ONE GREEN STRIPE		
402486	402487	2BP	654 48 BL. S.M. 664	INT. .440 EXH. .440	T.D.C. 		THREE ORANGE STRIPES		
400014	400015	2K	654 "A" CAR EXC. 48 BL. S.M.	INT. .400 EXH. .400	T.D.C. 		Ⓒ ONE BLUE STRIPE & ONE WHITE STRIPE		

CONTINUED
ON PAGE 18

TITLE				CHART - CAMSHAFT IDENTIFICATION			
DATE	BY	REV	DATE	BY	REV	DATE	BY
10-18-70	CC	COLOR CODE REV	10-18-70	CC	COLOR CODE REV	10-18-70	CC
9-30-70	CC	11-43 LVL SWR STEW	9-30-70	CC	11-43 LVL SWR STEW	9-30-70	CC
9-28-70	CC	11-43 LVL SWR STEW	9-28-70	CC	11-43 LVL SWR STEW	9-28-70	CC
DATE	SYM	REVISION	DATE	SYM	REVISION	DATE	SYM
FIRST USED				1971			
OLDSMOBILE ENGINE				ASSEMBLY MANUAL			
MANUAL SEC				6			
PAGE				16			
SERIES				400-657 659 664			
PART NO				407269			

1971 PRODUCTION PUSH RODS

PART NO.	IDENTIFICATION (EACH END)	LENGTH	ENGINE USAGE	REMARKS
398687	BANK OF GREEN	8.265	654	
01479	BANK OF YELLOW	9.570	657 - 659 - 664	

Shown on Chart 397366

9.570
8.265

1.305

1971 PRODUCTION TIMING CHAIN & SPROCKETS

ENGINE USAGE	PART NO.	PART NAME	SPROCKET		CHAIN WIDTH	IDENTIFICATION
			P.D.	TOOTH WIDTH		
654	382881 401584 OPT.	TIMING CHAIN	---	---	L.B. - .745 M.C. - .637	NONE
	381263 OR 383788	CAMSHAFT SPROCKET	5.737	$\frac{.410}{.400}$	---	
	382880	CRANKSHAFT SPROCKET	2.879			
657 659 664	559446	TIMING CHAIN	---	---	M.C. - .875 L.B. - .844	
	405866 OPT.				M.C. - .762	
	388049 OR 388056	CAMSHAFT SPROCKET	5.737	$\frac{.529}{.521}$	---	
	388057	CRANKSHAFT SPROCKET	2.879			

L.B. - Link Belt Company
M.C. - Morse Chain Company

1971 PRODUCTION VALVE LIFTERS

PART NO.	O.D.	LENGTH	FINISH	IDENTIFICATION	ENGINE USAGE
5232755	.8422-.8427	2.000	PLAIN	PLAIN SNAP RING	ALL
5232756	.010 O.S.			"10"	

1971 PRODUCTION STANDARD SIZE VALUES

VALUE		SHOWN ON	ENGINE USAGE	IDENTIFICATION			HEAD DIA & SEAT ANGLE	LENGTH FROM GAGE LINE
PART NO	TYPE			PAINT	FORGED	OTHER		
99809	INTAKE	399808	654	YELLOW	O1A S1A	NONE	1.875 46°	
03350	INTAKE	403349	<u>659</u> 664 MARINE IRRIGATION	BRIGHT RED	O5A S5A	NONE	2.072 60°	4.593
89451	INTAKE	389450	657	BLACK	O3A S3A	NONE	1.995 46°	4.587
01768	EXHAUST	401767	654	LIGHT BLUE	E1A T1A	NONE	1.562 46°	4.620
01762	EXHAUST	401761	657- <u>659</u> -664 MARINE IRRIGATION	WHITE	E3A T3A	NONE	1.624 46°	4.587

"O" OR "T" - TRW

"S" OR "E" - EATON

"A" - ALUMINIZED

1971 PRODUCTION VALVE SPRINGS

SPRING ASM.	SPRING	WIRE DIA.	DAMPER	INTAKE	EXHAUST	USAGE
397583	397584	.192	397585	X	X	MARINE & IRRIGATION 654 4 BBL. S.M. 659 EXC. W30 - 664 ALL
					X	654 & 657
NONE	387720	.192	NONE	X		654 EXC. 4 BBL. S.M. 657
398247	397207	.192	397585	X	X	W30

REVISED 1-13-71

1971 PRODUCTION STARTER MOTORS

PART NO	ENGINE USAGE	IDENTIFICATION	REMARKS
08386	654	RED TAPE	
08387	657 B 2 BBL 657 A CAR ALL 659	NONE	HIGH PERFORMANCE
08389	657 B-C 4 BBL MARINE IRRIGATION	YELLOW TAPE	ULTRA HIGH PERFORMANCE
08352	TORO	NONE	

REVISED 1-13-71

PAGE 31

1971 PRODUCTION COILS

PART NO.	ENGINE USAGE	IDENTIFICATION	REMARKS
1115292	654	EMBOSSSED FIGURES "292"	INSTALL IN ENGINE PLANT
1115216	657 - 659	"216"	INSTALL IN ENGINE PLANT
1115221	664	"221"	INSTALL IN FINAL ASM.

6299314 Cable Assembly - Coil to Distributor 654 - 657 - 659.

6297881 Cable Assembly - Coil to Distributor 664.

1971 PRODUCTION DISTRIBUTORS

PART NO	ENGINE USAGE	IDENTIFICATION (PAINT STRIPE)	TIMING BTC	VACUUM UNII
1112081	654 2BBL & 4BBL SM	DARK BROWN	10° AT 1100 RPM	1973407
1112085	654 4BBL A.T	BLACK	12° AT 1100 RPM	1973407
1112033	657	GREEN	8° AT 1100 RPM	1973408
	(657) EXC W30		10° AT 1100 RPM	
1112078	664	BROWN	10° AT 1100 RPM	1973408
1112034	W30 A.T	PURPLE	10° AT 850 R.P.M	1973407
1112036	W30 S.M	RED	12° AT 850 RPM	1973407
1111978	MARINE REGULAR IRRIGATION	PINK	10° AT 1100 RPM	1973430
1111982	MARINE PERFORMANCE	GRAY	12° AT 1100 RPM	1933427

1971 PRODUCTION SPARK PLUGS

PART NO	TYPE	ENGINE USAGE	GAP	REMARKS
5611765	R465	654 2 BBL ALL & 4 BBL A.T 657 664	.040	
5611766	R455	654 4 BBL S.M 659	.040	
5611518	R445	MARINE	.030	
5611519	R455	IRRIGATION	.030	

1971 PRODUCTION SPARK PLUG WIRES

PART NO	LENGTH	POSITION AND ENGINE USAGE							
		1	2	3	4	5	6	7	8
8904540	26.5	"E" CAR ONLY							
8904541	25.5	A-B-C CAR	ALL		ALL				
8904542	22.5					ALL			ALL
8904544	20.5						ALL	ALL	
8904543	24.0			ALL					

NEW WIRES FOR 1971 HAVE "SNAP-LOCK"
FEATURE AT SPARK PLUG END

REVISED 9-22-7

PAGE 35

1971 PRODUCTION CAST ACCESSORY MOUNTING BRACKETS

PART NO.	PART NAME	USAGE	REMARKS
398682	BRACKET - COMP. FRONT	"A" & "E" CAR	
391366	BRACKET - COMP. REAR		
398684	BRACKET - COMP. FRONT	"B" & "C" CAR	
399802	BRACKET - COMP. REAR		
397209	BRACKET - GENERATOR	ALL NON A/C	

1971 PRODUCTION DIST. VAC SWITCH & DASHPOT USAGE

PART NAME	PART NO	USAGE
DIST. VAC CONTROL SWITCH ASSEMBLY	410052	654 (SM A/C OR Y72) & ALL AT 657 ALL 659 ALL 664 ALL
DASHPOT	409764	654 S.M "A" CAR ONLY - F.85 350 654 A.T A/C - 350 659 SM. ALL & AT WITH A/C - 442 657 AT WITH A/C - 98 664 ALL Toro

REVISED 9-22-7

PAGE 37

1771 PROJECTION MAIN BEARINGS

ENGINE	BEARING MATERIAL	IDENTIFICATION		PART NO	LOCATION	USAGE
		APPEARANCE	OTHER			
350 CID 250 C/S (JOURNALS)	M100	BRIGHT	NONE ON STD SIZES	5458918	#1 UPR	ALL
					#2 & 4 UPR & LWR	
				5466252	#1 LWR	
				5458922	#3 UPR & LWR	
				5458926	#5 UPR	
				5458930	#5 LWR	

ONLY STD SIZE BRCS ARE SHOWN ON THIS CHART.

ALL STD BRCS HAVE A .0005"-.0010 & .0015" UNDERSIZE COUNTERPART

ALL MAIN BRCS WILL BE SELECT FITTED PER FITS CHARTS SHOWN
ON PAGES 10 & 14 OF THE ENGINE ASM MANUAL

1971 PRODUCTION MAIN BEARINGS

ENGINE	BEARING MATERIAL	IDENTIFICATION		PART NO.	LOCATION	USAGE
		APPEARANCE	OTHER			
455 (3.00 C/S Journal)	M400	DULL	NONE ON STD. SIZES	5458618	#1 - 2 & 4 UPR	ALL 455
					#2 & 4 LWR	
				5466192	#1 LWR	
				5463660	#3 UPR & LWR	
	M100	BRIGHT	NONE ON STD. SIZES	5466194	#5 UPR.	
				5466195	#5 LWR.	

ONLY STD. SIZE BRGS. ARE SHOWN ON THIS CHART.
 ALL STD. BRGS. HAVE A .0005-.0010 & .0015 UNDERSIZE COUNTERPART.
 ALL MAIN BRGS. WILL BE SELECT FITTED PER FITS CHARTS SHOWN
 ON PAGES 4, 5 & 6 OF THE ENGINE ASM. MANUAL.

REVISED 1-13-71

1971 PRODUCTION CONNECTING ROD BEARINGS

SIZE	PART NO.	BEARING MATERIAL	CRANKPIN DIA.	USAGE	IDENTIFICATION	
					APPEARANCE	OTHER
STD.	5468278	M100	2.1243	350 2 Bb1	BRIGHT	M100 STAMPED ON O.D.
	5470451	M390	2.1243	350 4 Bb1	SEMI-BRIGHT	Blue Dye & M390 STAMPED ON O.D.
	5470447	M400 (CONECC)	2.4993	455 ALL	DULL	M400 STAMPED ON O.D.
.010 UNDERSIZE	5470452	M390	2.1143	350 ALL	SEMI-BRIGHT	YELLOW DYE & .010 STAMPED ON O.D.
	5470448	M400 (CONECC)	2.4893	455 ALL	DULL	

1971 PRODUCTION GENERATORS

PART NO	CODE	TYPE	DE. ROT.	PULLEY		USAGE
				DIA	GROOVES	
1100566	DK	DN 37	270°	243	1	A CAR STD EXC 442
1100934	DE	SI 37	"	243	1	442 STD
1100567	DL	DN 42	"	243	1	B-C-E STD
1100569	DN	DN 55	"	250	1	A CAR C60/Y72 EXC 442
1100552	SV	SI 55	"	262	1	442 C60/Y72
1100568	DM	DN 55	"	224	1	B CAR 350 C60 B CAR 455 28BL C60
1100570	DP	DN 61	"	224	1	B CAR 48BL C60 B CAR Y72 C CAR C60/Y72 E CAR C60/Y72
1100571	DR	DN 63	"	224	1	A-B-C-E C49 EXC 442
1100592	DS	SI 63	"	262	1	442 C49
1100851	AL	DN 60	"	250	1	K81

A) REQUIRES 1119519 REGULATOR

B) " 1119515 "

1971 PRODUCTION A/C COMPRESSORS

PART NO	USAGE	PULLEY		REMARKS
		P.D	O.D	
5910731	L6	4.75	4.89	
5910776	ALL "A" CAR & 350 "B"	5.00	5.14	
5910730	455 B-C CAR	4.26	4.72	
5910781	TORO	5.00	5.14	SAME AS 5910776 EXC HAS SUPER HEAT SWITCH

1971

ALL ENGINES ARE TO BE TESTED WITHOUT LOAD, USING COMPRESSED AIR-MOTERING METHOD.

ITEM	TESTING TIME	ENGINE SPEEDS	OPERATION
(1)	2 MINUTES MINIMUM	850 RPM	ENGINE INSPECTION, SET INITIAL IGNITION TIMING PER CHART ON PAGE 54 AND ASSEMBLY BALANCE ENGINE PER ENGINE BALANCING INSTRUCTION CHART ON PAGE 58
(2)	1 MINUTE ALLOWANCE	200 RPM	ENGINE INSPECTION

THE FOLLOWING WATER LEAK TESTS ARE USED ONLY WITH ENGINES BALANCED AND RUN USING THE AIR-MOTERING METHOD.

1. TEST FOR INTERNAL WATER LEAKS. (ENGINE NOT RUNNING).

- ENGINE ASSEMBLED, ALL WATER OPENINGS CLOSED EXCEPT: WATER SOURCE CONNECTED TO WATER PUMP INLET - WATER OUTLET OPEN.
- FILL ENGINE WITH 120° F. $\pm$ 20° F. WATER AT 0 PSI TO THE LEVEL OF WATER OUTLET.
- WITH CRANKCASE OPENINGS CLOSED, PRESSURIZE WITH AIR TO 10 $\pm$ 2 PSI.
- INTERNAL WATER LEAKS ARE PRESENT IF AIR BUBBLES ARE PRESENT IN THE WATER OUTLET (STREAM OF BUBBLES OR RISE IN WATER LEVEL CAUSING SPLASH).

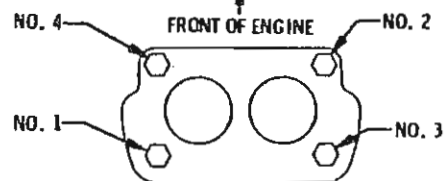
2. TEST FOR EXTERNAL WATER LEAKS. (ENGINE NOT RUNNING).

- ENGINE ASSEMBLED, ALL WATER OPENINGS CLOSED EXCEPT: WATER SOURCE CONNECTED TO WATER PUMP INLET - WATER SOURCE CONNECTED TO WATER OUTLET.
- FILL ENGINE WITH 120° F. $\pm$ 20° F. WATER, PRESSURIZE 15 TO 25 PSI.
- EXTERNAL LEAKS ARE PRESENT IF WATER OR BUBBLES ARE OBSERVED ESCAPING FROM ENGINE.

NOTE: EITHER LEAK TEST MAY BE CONDUCTED FIRST.

OIL PRESSURE TOLERANCE FOR MOTOR PLANT
20 LBS. MIN. AT 850 RPM WITH TANK TEMPERATURE 150° TO 160° F.

				TITLE				CHART - ENGINE TESTING			
				DATE <i>OCTOBER 15, 1970</i>				FIRST USED			
				DR BY <i>CVL</i>				1971			
				CHECKED <i>[Signature]</i>				OLDSMOBILE ENGINE			
				APPR <i>[Signature]</i>				ASSEMBLY MANUAL			
				APPV <i>[Signature]</i>				MANUAL SEC			
								6			
								PAGE			
								64			
								SERIES			
								PART NO			
								407269			
DATE	SYM	REVISION	DR	CR	APPV	REP	REV	REV	REV	REV	REV

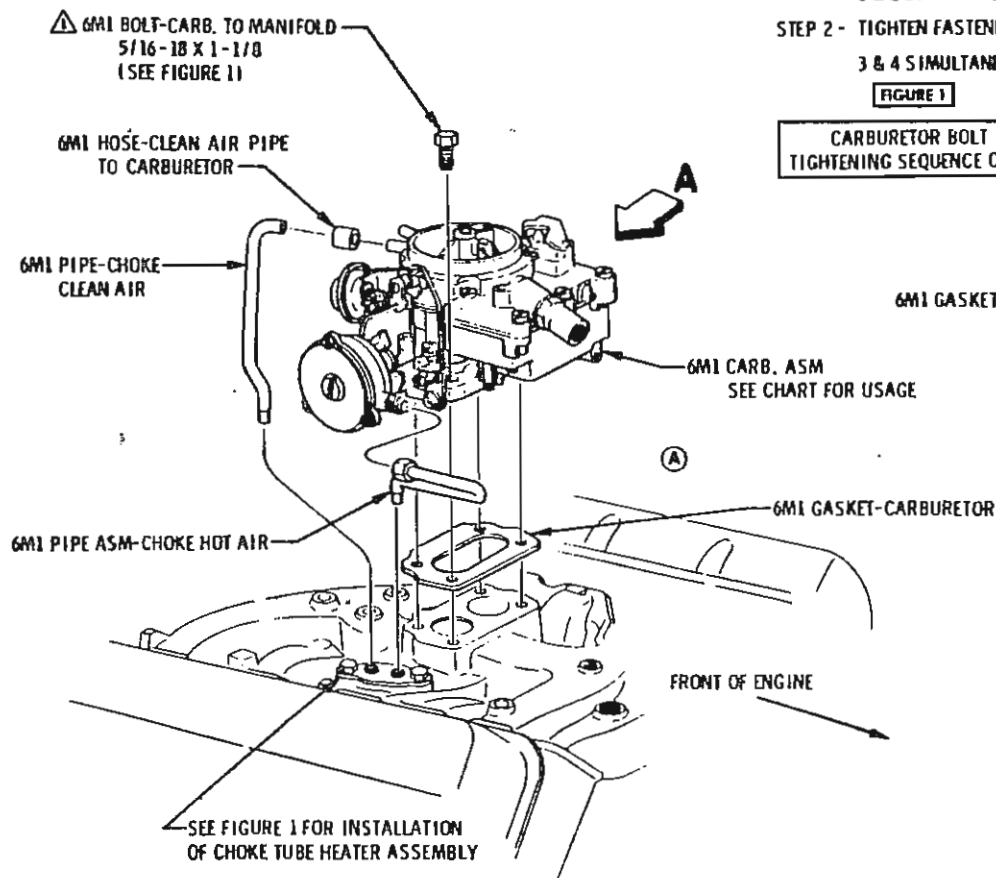


STEP 1 - TIGHTEN FASTENERS
1 & 2 SIMULTANEOUSLY
STEP 2 - TIGHTEN FASTENERS
3 & 4 SIMULTANEOUSLY

FIGURE 1

CARBURETOR BOLT
TIGHTENING SEQUENCE CHART

CARBURETOR USAGE CHART					
ENGINE USAGE	S.M.	A.T.	AIR COND.	ASM CODE	IDENTIFICATION
654	X		YES/NO	NC	PART NUMBER AND CODES STAMPED ON RIGHT FRONT SIDE
654		X	YES/NO	ND	
657	X	X	YES/NO	RF	



CARBURETOR & CHOKE AIR
PIPE INSTALLATION

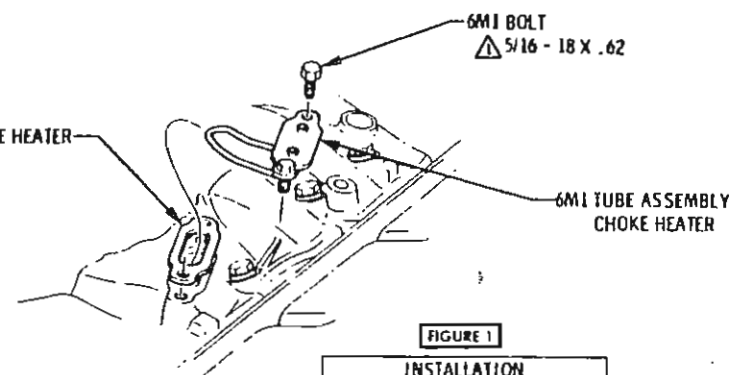
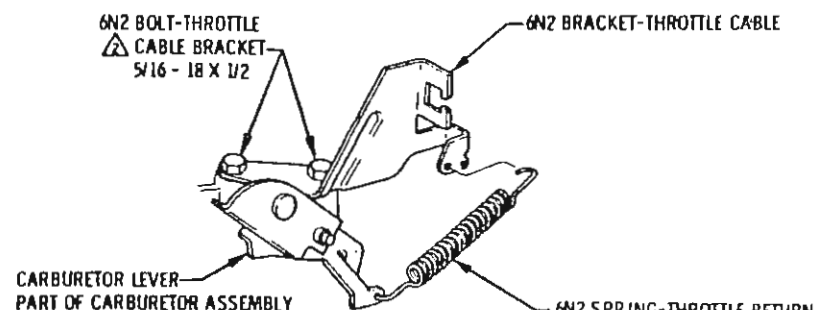


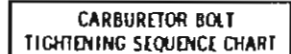
FIGURE 1
INSTALLATION
CHOKE TUBE HEATER ASSEMBLY



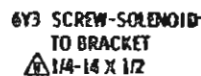
VIEW A

14-17 LB. FT.
10-15 LB. FT.
FULLY DRIVEN SEATED
AND NOT STRIPPED

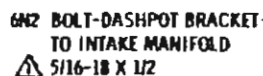
TITLE		2-BARREL CARBURETOR AND CHOKE AIR PIPES			
DATE	JUNE 26, 1970	FIRST USED	1971	OLDSMOBILE ENGINE	MANUAL SEC
DR BY	CHET MAY	REF.	654-657	ASSEMBLY MANUAL	PAGE
CHECKED	MTD	SERIES		6	66
DATE	7/29/70	APPROV		PART NO	407269
SYM		DR	CL		
REVISION		APPR			



						TITLE		4-BARREL CARBURETOR AND CHOKE AIR PIPES	
						DATE		JUNE 26, 1970	
						OR BY		1971	
						CHECKED BY		M. J. Bannhart	
9-23-70		B		NOTE ADDED		REV		654-657	
7-21-70		A		CHART REV		APPR		659-664	
DATE		SYD		REVISION		OR. CL.		PART NO.	
								407269	



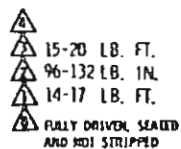
Ⓔ



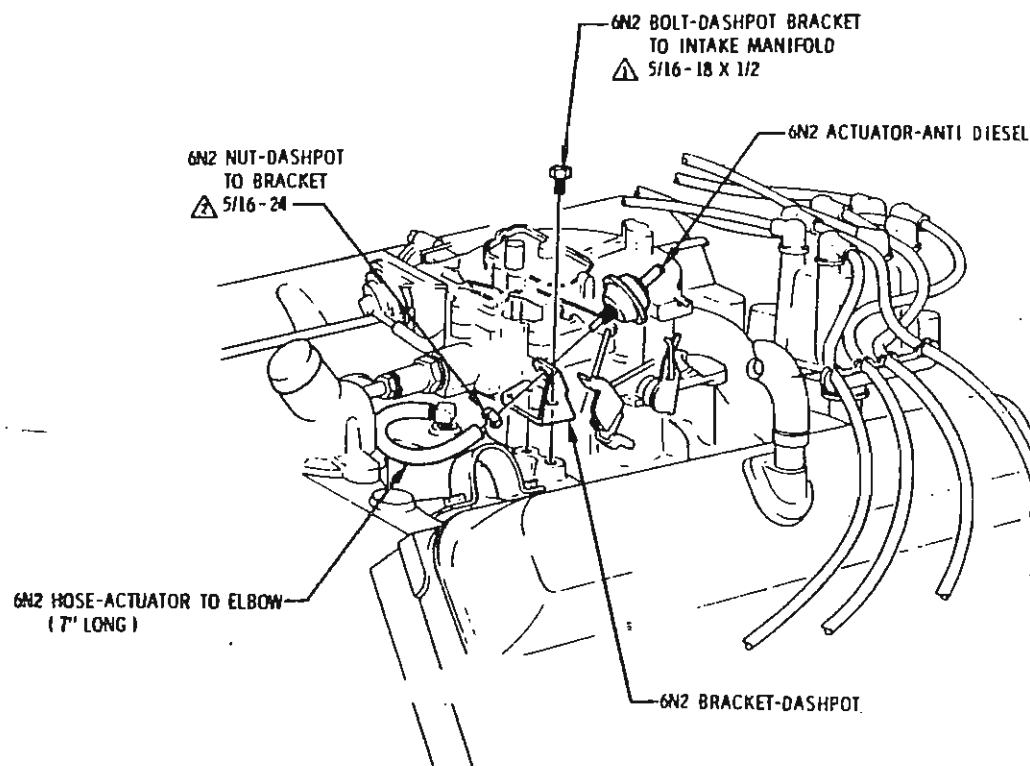
©

INSTALLATION DASH POT ASM
654 2BBL. S.M. "A" & ALL A.T. WITH A/C
657 A.T. WITH A/C
659 S.M. ALL & A.T. WITH A/C

⑤



8-23-70	E	USAGE REVISED	CUT	TITLE	DISTRIBUTOR VACUUM SOLENOID & DASHPOT ASM					
8-19-70	D	MENY REMOVED	CUT	DATE	JUNE 26, 1970	FIRST USED		OLDSMOBILE ENGINE	SERIAL NO.	PAGE
8-10-70	C	USAGE REVISED	CUT	DR BY	CURT NAY	1971		ASSEMBLY MANUAL	6	70
8-10-70	G	DASHPOT REVISED	CUT	CHECKED	PROBANT					
7-28-70	A	654 USAGE REVISED	CUT	APPR	(Signature)					
DATE	SYM	REVISION	ENG.	COPIES		REV	654 657 659 664	SERVICE	PART NO.	407269



INSTALLATION
ANTI DIESEL ACTUATOR

350 4BBL. S.M.

ACTUATOR ADJUSTMENT-
WITH ACTUATOR AND NUT LOOSE ASSEMBLED TO
DASHPOT BRACKET, CARBURETOR AT SLOW IDLE
POSITION, AND 10-20" H.G. VACUUM APPLIED
TO ACTUATOR:

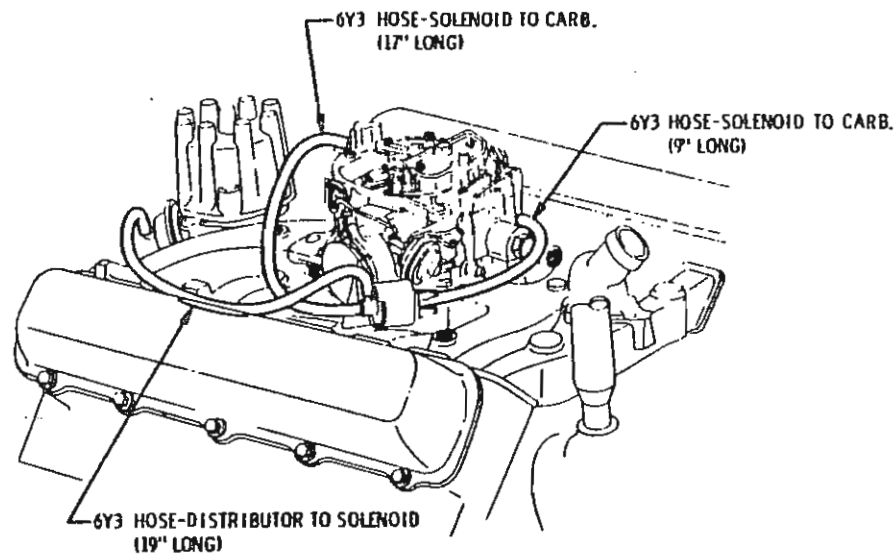
1. ADJUST ACTUATOR POSITION SO THAT ACTUATOR
STEM JUST CONTACTS CARB. LEVER.
2. TIGHTEN LOCK NUT TO SPECIFIED TORQUE.
3. TURN SLOW IDLE ADJUSTMENT SCREW
COUNTER CLOCKWISE ONE TURN.

96-132 LB. IN.
14-17 LB. FT.



FULLY DRIVEN, SEATED
AND NOT STRIPPED

				TITLE ANTI DIESEL ACTUATOR					
				DATE MAY 1, 1971		FIRST USED 1971		OLDSMOBILE ENGINE ASSEMBLY MANUAL	
				DR BY CRET MAY		REF. 654		SERIES	
				CHECKED J. J. Bland				PART NO.	
				APPR. J. J. Bland				407269	
DATE	SYM	REVISION	DR	CR	APPR				



Ⓑ 654 4-BBL. S.M.
EXC. A/C OR 35Y72

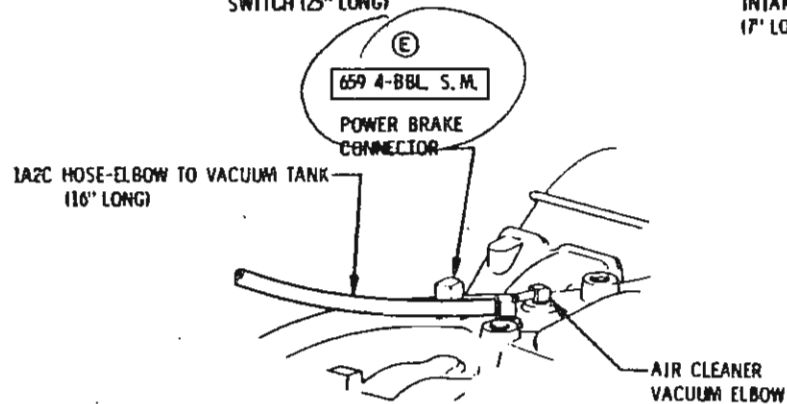
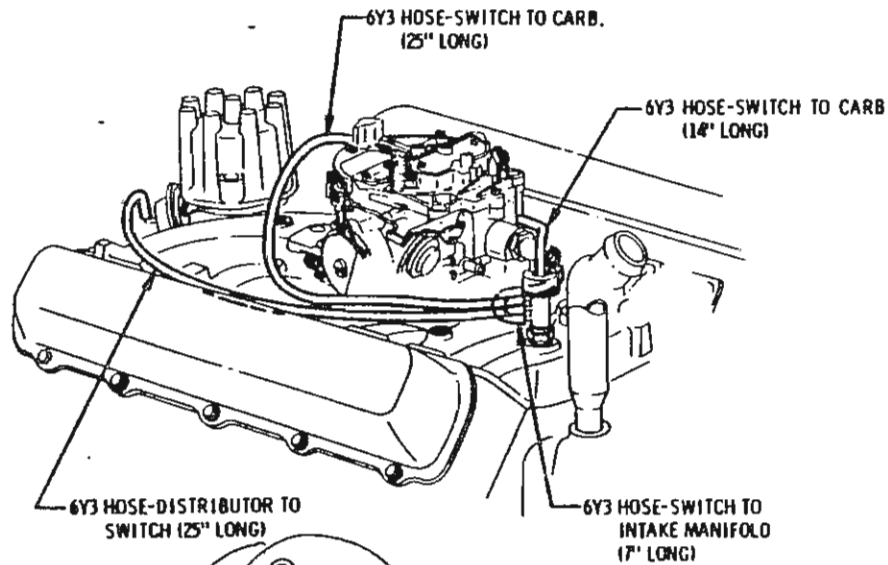
Ⓐ

				TITLE 4-BBL. ENGINE VACUUM HOSES			
DATE		JUNE 22, 1970		FIRST USED		1971	
DATE		BY		CHECKED		APPROVED	
9-19-70		B		USAGE REVISED		2-17-71	
9-20-70		J		VAC-V REMOVED		2-17-71	
DATE	STM	REVISION	DEL. CR.	APPR.	REF	SERIES	PART NO.
					654 657		407269

OLDSMOBILE ENGINE
ASSEMBLY MANUAL

MANUAL SEC
6

PAGE
76



① INSTALLATION
A/C HEATER VACUUM HOSE
350 CU. IN. "A" CAR

FRONT OF ENGINE

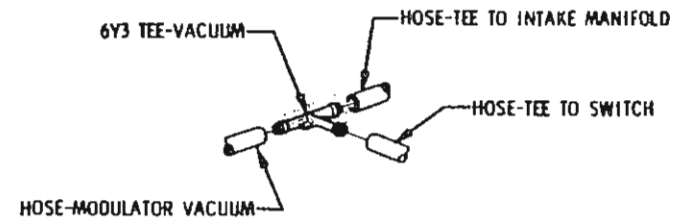
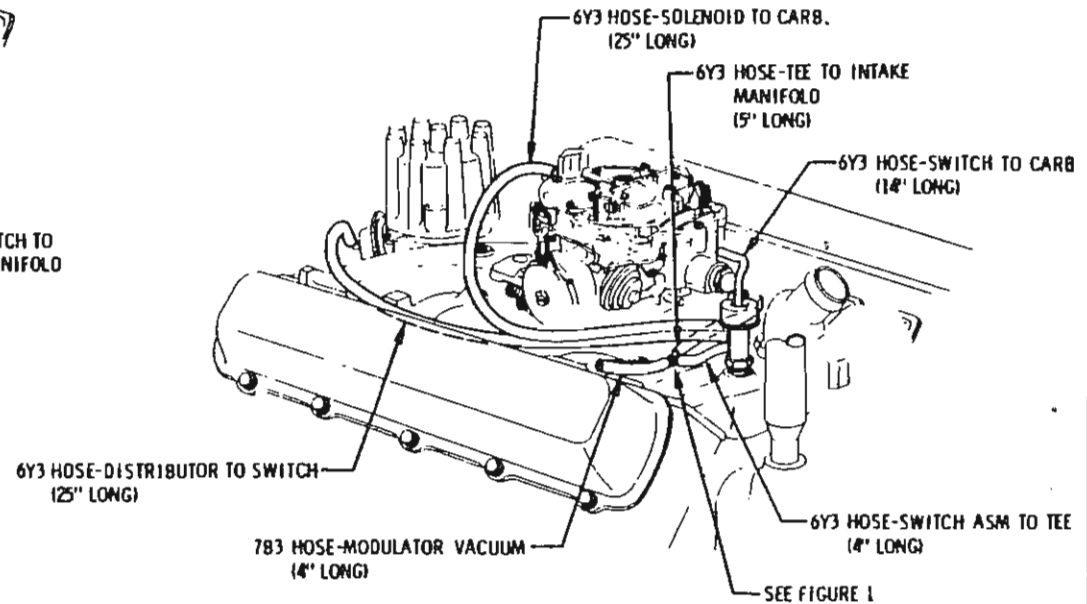


FIGURE 1



654 4-BBL. A. T.
657-659 4-BBL. A. T.

5-1-71	E	USAGE REVISED	C	PM	TITLE 488L ENGINE VACUUM HOSES-					
9-29-70	D	VIEW ADDED	C	PM	DATE JUNE 22, 1970	FIRST USED	OLDSMOBILE ENGINE	MATERIAL INC	PAGE	
9-29-70	C	USAGE REV	C	PM	DR BY CYRIL MAY	1971	ASSEMBLY MANUAL	6	78	
9-13-70	BT	HOSE LENGTH REV	C	PM	CHECKED/PP/1st-Last					
9-2-70	RE	HOSE 15" LONG	C	PM	APPR	REC'D				
DATE	SYM	REVISION	DR	CL	APPR	654 657 659		PART NO.	407269	

OLDSMOBILE DIVISION

GENERAL MOTORS CORPORATION
LANSING 11, MICHIGAN

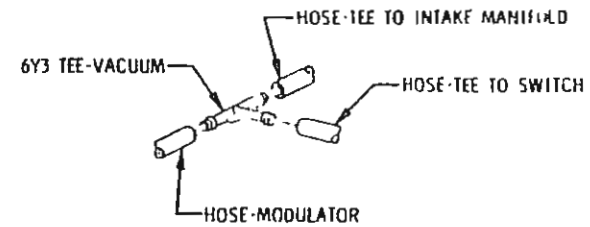
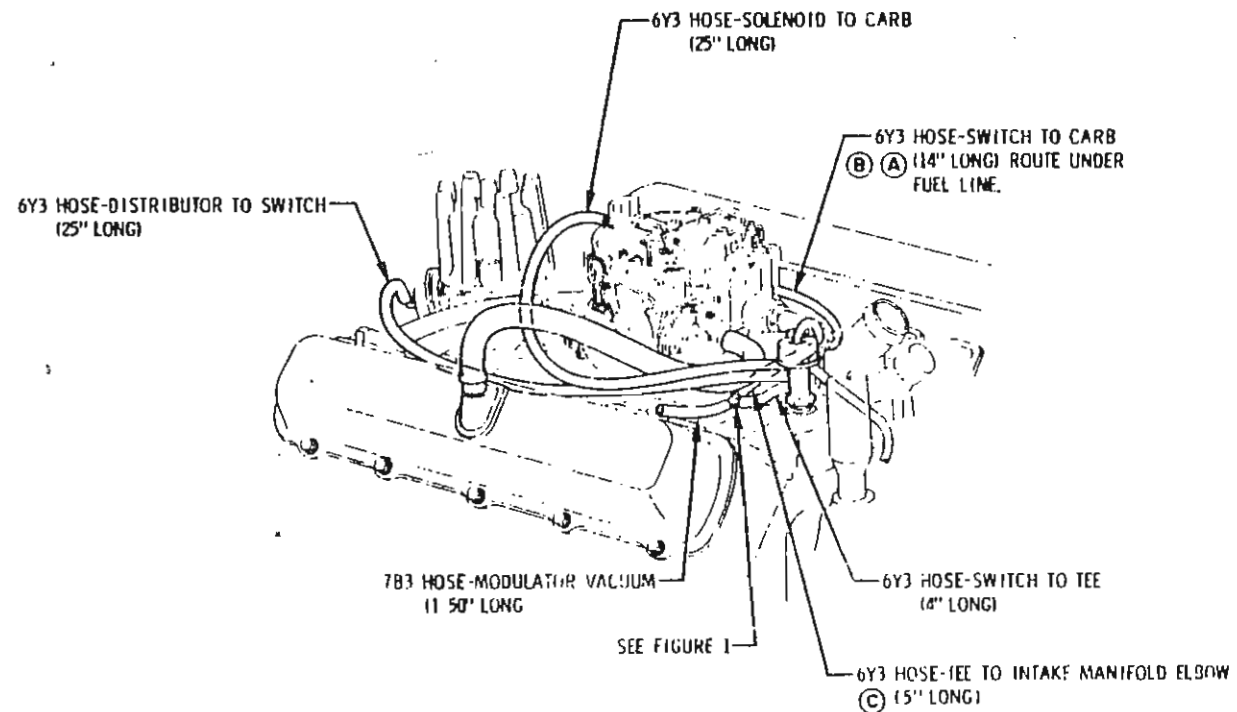


FIGURE 1



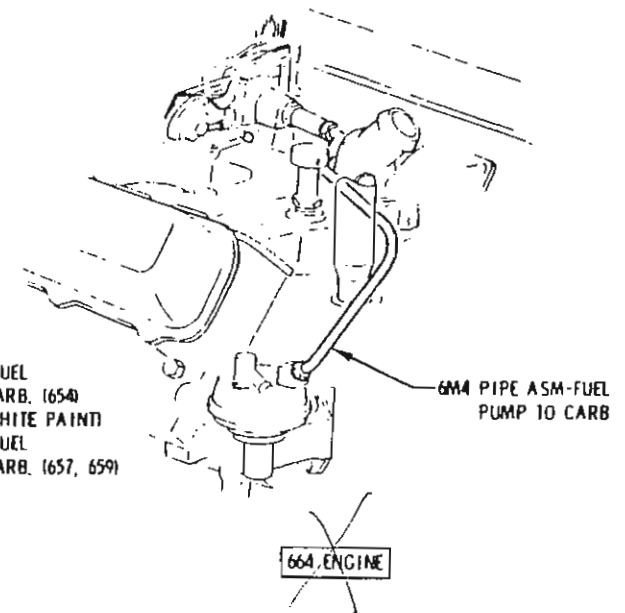
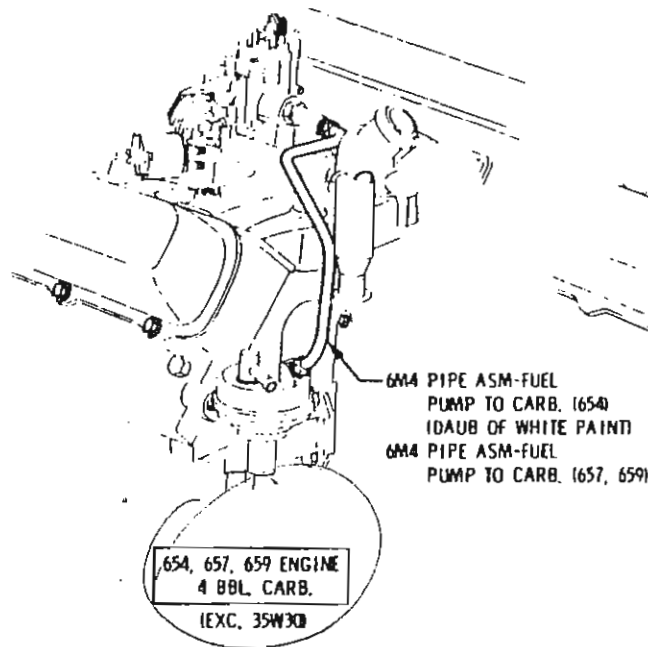
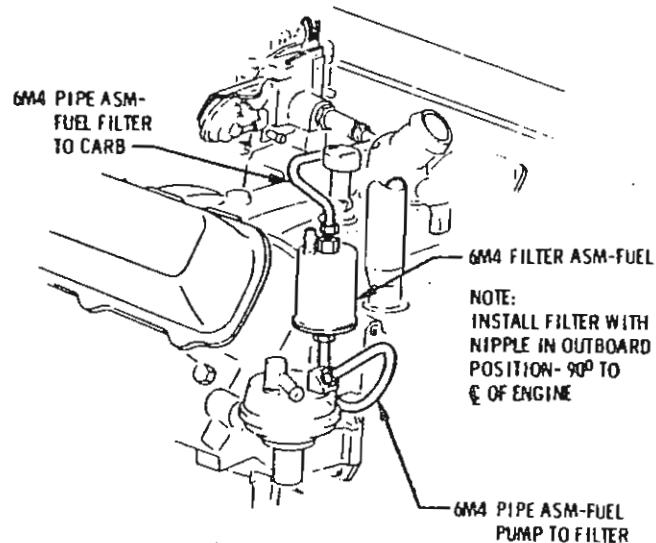
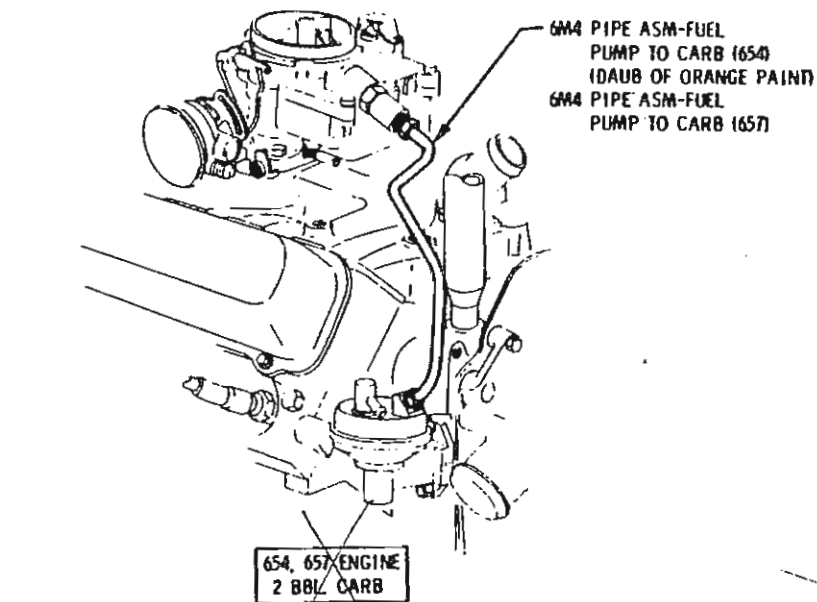
664 ONLY



FULLY DRIVEN, SEATED
AND NOT STRIPPED

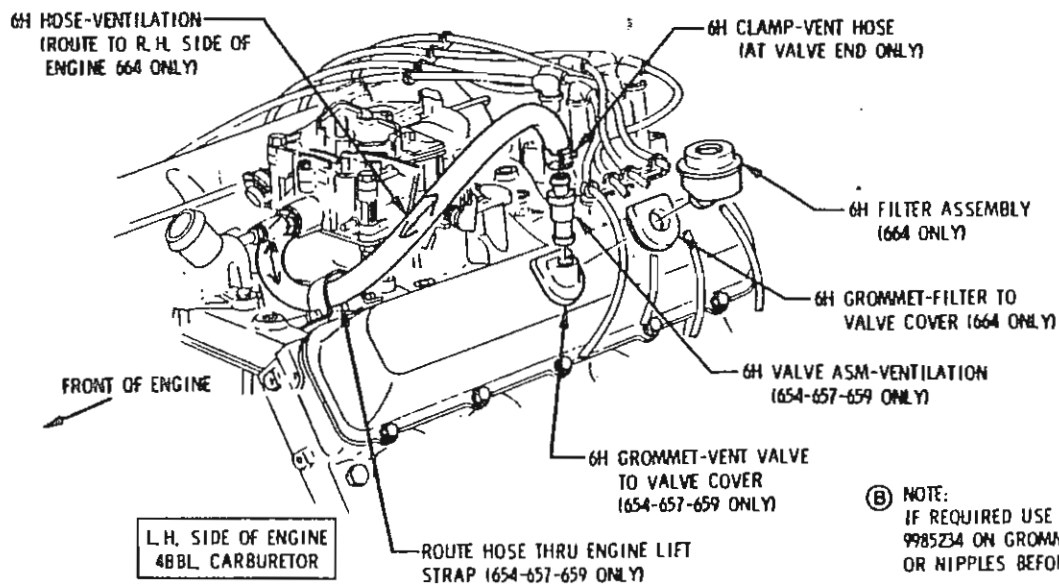
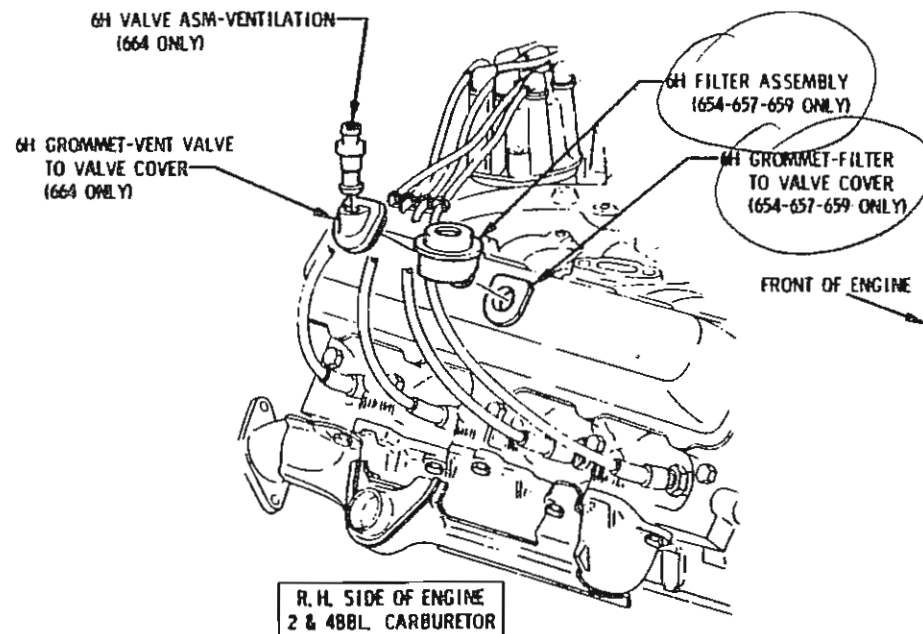
DATE				REVISION				DATE				REVISION			
1-29-71	C	WAS 4' LONG		1-29-71	B	HOSE RE-ROUTED		1-2-70	A	WAS 15' LONG		7-2-70		RE-PRIN'D & CHANGED	
DATE				REVISION				DATE				REVISION			
DATE				REVISION				DATE				REVISION			

TITLE				ENGINE VACUUM HOSES			
DATE JUNE 26, 1970				ENGINE USED			
DR BY CRET MAY				1971			
CHECKED BY J. B. B. H. T.				OLD SMOBILE ENGINE			
APPROVED BY J. B. B. H. T.				ASSEMBLY MANUAL			
664				664			
PART NO.				80			
407259				407259			



BLOW OUT MAIN FUEL LINE JUST PRIOR
TO INSTALLATION WITH FILTERED AIR
USING A MINIMUM OF 30 P.S.I. AIR
PRESSURE TO INSURE REMOVAL OF ANY
FOREIGN MATTER

TITLE				FUEL PUMP ASM TO CARBURETOR PIPE ASSEMBLY			
DATE	JUNE 26, 1970	FIRST USED	1971	OLDSMOBILE ENGINE	MANUAL SEC	PAGE	82
DR BY	CHERT 1-24	CHECKED	MTB	ASSEMBLY MANUAL	6		
APPR	For the General	REV	004	SERVICE		PART NO	407269
DATE	SYM	REVISION	DR	CL	APP		



NOTE:
IF REQUIRED USE LUBRICANT
9985234 ON GROMMETS, HOSES,
OR HIPPLES BEFORE ASSEMBLY

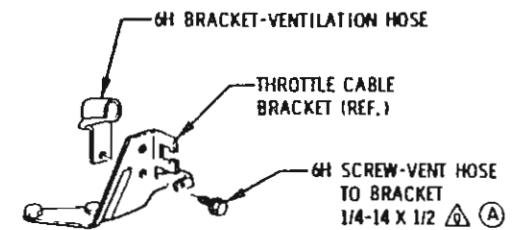
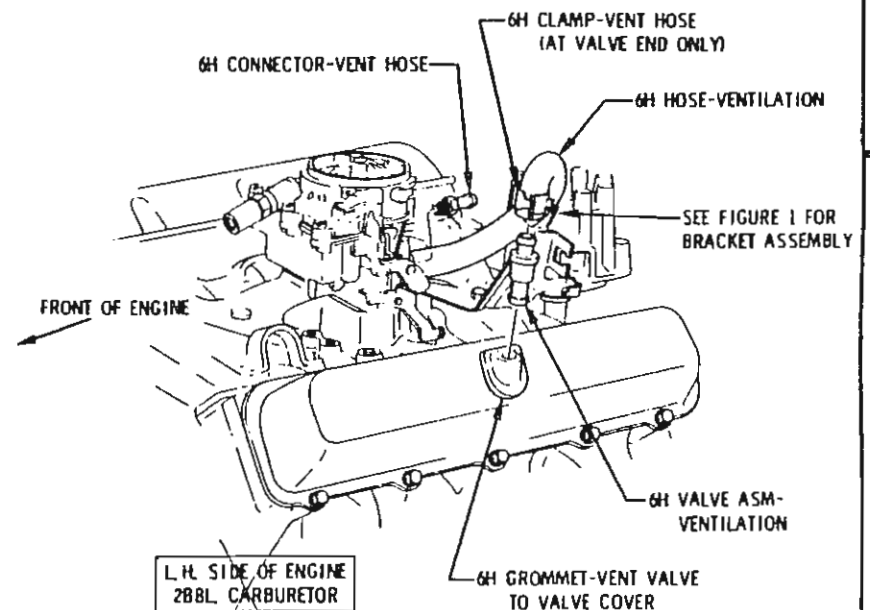


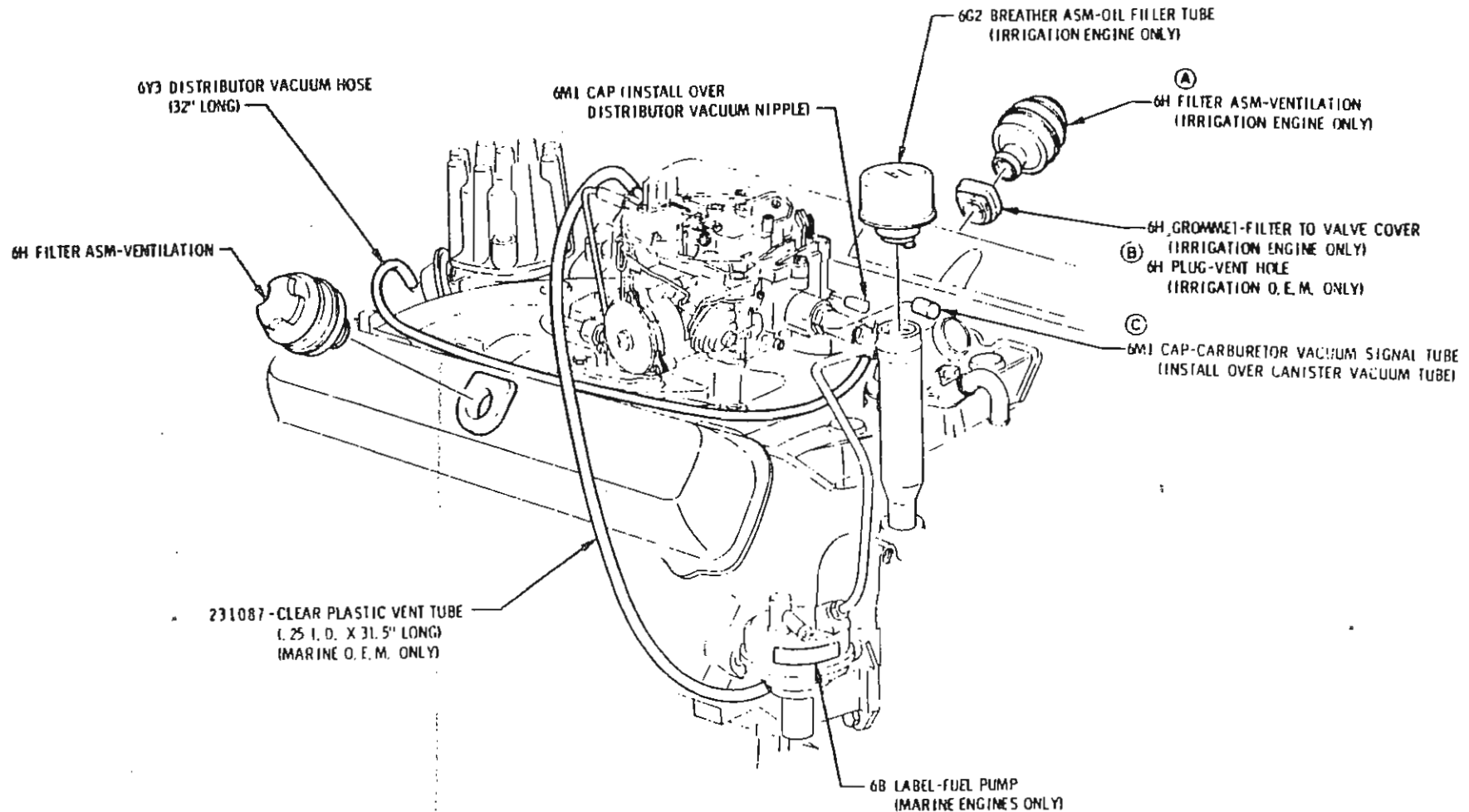
FIGURE 1



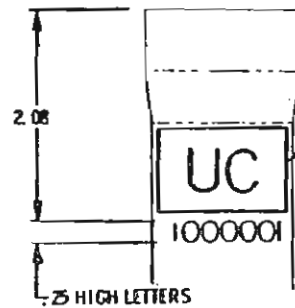
NOTE:
SEE PAGE 86 FOR INSTALLATION
OF DUAL VENTILATION



TITLE				CRANKCASE VENTILATION (EXCEPT DUAL VENTILATION)			
DATE	JUNE 26, 1970	FIRST USED	1971	OLDSMOBILE ENGINE ASSEMBLY MANUAL	6	84	
DR BY	CVT MDI	CHECKED	MBR	REV	1	2	
APPR	MBR	APPR	MBR	REV	3	4	
DATE	SYM	REVISION	ON	CL	APPR	PART NO.	407269

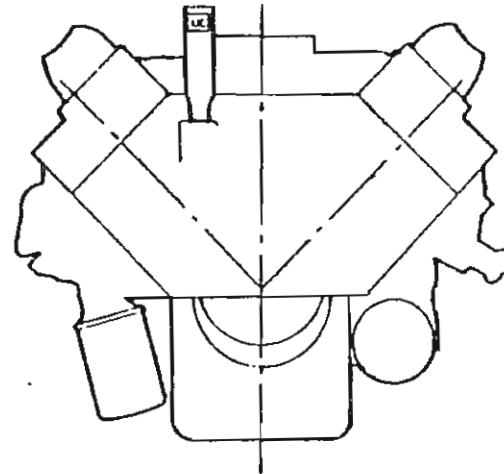


TITLE				VACUUM & VENT HOSE, (MARINE & IRRIGATION ENGINES ONLY)			
DATE	JUNE 30, 1970	FIRST USED	1971	OLDSMOBILE ENGINE	MANUAL REC	6	PAGE 88
BY	YIP T. W. Y	CHECKED	YIP T. W. Y	ASSEMBLY MANUAL			
NO.	657	SERIES		PART NO.			407269



INSTALL TAPE ON OIL FILLER
TUBE ABOVE ENGINE NUMBER
AS SHOWN

ENGINE NUMBER TO BE STAMPED ON
OIL FILL TUBE AS SHOWN AND TUBE
TO BE ASSEMBLED TO ENGINE SO
NUMBER MAY BE READ FROM FRONT.



ALL ENGINES WILL BE NUMBERED CONSECUTIVELY
STARTING WITH 1000001

FOR COMPLETE ENGINE IDENTIFICATION, THE ENGINE
NUMBER AND ENGINE TAPE CODE SHOULD BE USED TOGETHER.

EXAMPLE: UC - 1000001
UNIT
YEAR
TAPE CODE

NOTE: THIS NUMBER IS USED FOR
MANUFACTURING AND
SERVICE ONLY. IT IS NOT
INTENDED FOR ANY LEGAL
USE.

				TITLE				ENGINE IDENTIFICATION			
				DATE <i>JUNE 26, 1970</i>				FIRST USED			
				NO. BY <i>QUET / MAY</i>				1971			
				CHECKED <i>H. Barnhart</i>				OLD SMOBILE ENGINE			
				APPRO. <i>V. J. ...</i>				ASSEMBLY MANUAL			
				REV. 604 651				MANUAL NO. 6			
				REV. 459 664				PAGE 90			
DATE				STN				DESIGNER			
DATE				STN				DESIGNER			
								PART NO. 407269			

GENERAL MOTORS CORPORATION
LANDING - MICHIGAN

[illegible]

GENERAL MOTORS CORPORATION
LANSING, - MICHIGAN.

[illegible]

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

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LANSING - MICHIGAN

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GENERAL MOTORS CORPORATION
LANSING -- MICHIGAN

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GENERAL MOTORS CORPORATION
LANSING, — MICHIGAN

SHEET 6

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

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[illegible]

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LANSING -- MICHIGAN

[illegible]

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1. *Enterobacteriaceae* 2. *Shigella* 3. *Salmonella* 4. *Yersinia* 5. *Shigella* 6. *Shigella* 7. *Shigella* 8. *Shigella* 9. *Shigella* 10. *Shigella* 11. *Shigella* 12. *Shigella* 13. *Shigella* 14. *Shigella* 15. *Shigella* 16. *Shigella* 17. *Shigella* 18. *Shigella* 19. *Shigella* 20. *Shigella* 21. *Shigella* 22. *Shigella* 23. *Shigella* 24. *Shigella* 25. *Shigella* 26. *Shigella* 27. *Shigella* 28. *Shigella* 29. *Shigella* 30. *Shigella* 31. *Shigella* 32. *Shigella* 33. *Shigella* 34. *Shigella* 35. *Shigella* 36. *Shigella* 37. *Shigella* 38. *Shigella* 39. *Shigella* 40. *Shigella* 41. *Shigella* 42. *Shigella* 43. *Shigella* 44. *Shigella* 45. *Shigella* 46. *Shigella* 47. *Shigella* 48. *Shigella* 49. *Shigella* 50. *Shigella* 51. *Shigella* 52. *Shigella* 53. *Shigella* 54. *Shigella* 55. *Shigella* 56. *Shigella* 57. *Shigella* 58. *Shigella* 59. *Shigella* 60. *Shigella* 61. *Shigella* 62. *Shigella* 63. *Shigella* 64. *Shigella* 65. *Shigella* 66. *Shigella* 67. *Shigella* 68. *Shigella* 69. *Shigella* 70. *Shigella* 71. *Shigella* 72. *Shigella* 73. *Shigella* 74. *Shigella* 75. *Shigella* 76. *Shigella* 77. *Shigella* 78. *Shigella* 79. *Shigella* 80. *Shigella* 81. *Shigella* 82. *Shigella* 83. *Shigella* 84. *Shigella* 85. *Shigella* 86. *Shigella* 87. *Shigella* 88. *Shigella* 89. *Shigella* 90. *Shigella* 91. *Shigella* 92. *Shigella* 93. *Shigella* 94. *Shigella* 95. *Shigella* 96. *Shigella* 97. *Shigella* 98. *Shigella* 99. *Shigella* 100. *Shigella*

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SHEET 11

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[illegible]

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

GRP.	PART NO.	PART NAME	ENGINE		455 CU. IN. "A" CAR																455 CU. IN. "B-C" CAR								"C" CAR				TYPE	455 CU. IN. SERVICE																																																																																																																																																																																																																																																																		
			ENGINE ASM CODE	ALL	TY	A2	TX	A2N	TW	A4	A4N	TU	S4	S4F	S4Z	A4V	A4NV	TL	TS	S4V2	TB	A4V	TP	A4NV	UE	S2	UC	A2	A2N	UD	A4	A4N		UV	A4	A4N	41341	41342	41343	41344	41345	41346	41347	41348	41349	41350	41351	41352	41353	41354	41355	41356	41357	41358	41359	41360	41361	41362	41363	41364	41365	41366	41367	41368	41369	41370	41371	41372	41373	41374	41375	41376	41377	41378	41379	41380	41381	41382	41383	41384	41385	41386	41387	41388	41389	41390	41391	41392	41393	41394	41395	41396	41397	41398	41399	41400	41401	41402	41403	41404	41405	41406	41407	41408	41409	41410	41411	41412	41413	41414	41415	41416	41417	41418	41419	41420	41421	41422	41423	41424	41425	41426	41427	41428	41429	41430	41431	41432	41433	41434	41435	41436	41437	41438	41439	41440	41441	41442	41443	41444	41445	41446	41447	41448	41449	41450	41451	41452	41453	41454	41455	41456	41457	41458	41459	41460	41461	41462	41463	41464	41465	41466	41467	41468	41469	41470	41471	41472	41473	41474	41475	41476	41477	41478	41479	41480	41481	41482	41483	41484	41485	41486	41487	41488	41489	41490	41491	41492	41493	41494	41495	41496	41497	41498	41499	41500	41501	41502	41503	41504	41505	41506	41507	41508	41509	41510	41511	41512	41513	41514	41515	41516	41517	41518	41519	41520	41521	41522	41523	41524	41525	41526	41527	41528	41529	41530	41531	41532	41533	41534	41535	41536	41537	41538	41539	41540	41541	41542	41543	41544	41545	41546	41547	41548	41549	41550	41551	41552	41553	41554	41555	41556	41557	41558	41559	41560	41561	41562	41563	41564	41565	41566	41567	41568	41569	41570	41571	41572	41573	41574	41575	41576	41577	41578	41579	41580	41581	41582	41583	41584	41585	41586	41587	41588	41589	41590	41591	41592	41593	41594	41595	41596

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GENERAL MOTORS CORPORATION
LANSING — MICHIGAN

REF. KEY
A, R, AS REQUIRED
★-OPTION

REF. KEY A. R. AS REQUIRED ★-OPTION			350 CU. IN. "A" CAR												350 CU. IN. "B" CAR		350 CU. IN. SERVICE			
			UPC CODE		PROD. CODE	TRANS.		CARB.		EXP.	COMP. RATIO		UPC CODE	PROD. CODE	TYPE	REMARKS				
						SM	A.T.	2 BBL	4 BBL		LOW	HIGH								
			GRP.	PART NO.	PART NAME	ENGINE ASMS	ALL	M38	QA											
1A2C																				
	407729	NIPPLE - HEATER HOSE																		
	382890	ELBOW - HEATER VACUUM																		
(C)	393523	HOSE-ELBOW TO VACUUM TANK																		
5																				
	143343	ELBOW - POWER BRAKE VACUUM																		

OLDSMOBILE DIVISION

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

			ENGINE		350 CU. IN. "A" CAR																350 CU. IN. "B" CAR				350 CU. IN. SERVICE			
			PROD	ENG																								
			CODE	CODE																								
			ALL	ALL	QA	A2		A2H		S2				AA	AAH		SA	SAH		TE	A2	TC	A2H					
GRP.	PART NO.	PART NAME	ENGINE ASM	ALL	408684			408686		408687				408689	408690		408692	408691		408621	408696	408695						
6A1	400427	BLOCK ASM-CYLINDER (TYPE A)		1																								
	400428	BLOCK ASM-CYLINDER (TYPE B)		★																								
	5458918	BEARING-CRANKSHAFT #1 UPR (STD.)		1																								
	5458919	BEARING-CRANKSHAFT #1 UPR (1.0005 U.S.)	AR																									
	5458920	BEARING-CRANKSHAFT #1 UPR (1.0010 U.S.)	AR																									
	5458921	BEARING-CRANKSHAFT #1 UPR (1.0015 U.S.)	AR																									
	5466252	BEARING-CRANKSHAFT #1 LWR (STD.)		1																								
	5466253	BEARING-CRANKSHAFT #1 LWR (1.0005 U.S.)	AR																									
	5466254	BEARING-CRANKSHAFT #1 LWR (1.0010 U.S.)	AR																									
	5466255	BEARING-CRANKSHAFT #1 LWR (1.0015 U.S.)	AR																									
	5458918	BEARING-C/SHAFT #2 & 4 UPR (STD.)		2																								
	5458919	BEARING-C/SHAFT #2 & 4 UPR (1.0005 U.S.)	AR																									
	5458920	BEARING-C/SHAFT #2 & 4 UPR (1.0010 U.S.)	AR																									
	5458921	BEARING-C/SHAFT #2 & 4 UPR (1.0015 U.S.)	AR																									

TITLE CHART - ENGINE ASSEMBLY

DATE APR 20, 1970

CHK BY J. W. SIMS

CHECKED BY [Signature]

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GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

GRP.	PART NO.	PART NAME	ENGINE		350 CU. IN. "A" CAR																350 CU. IN. "B" CAR				350 CU. IN. SERVICE																																																																																																																																																																																																																																																																																																													
			ENGINE ASM	ALL	ENGINE CODE																ENGINE CODE				TYPE																																																																																																																																																																																																																																																																																																													
					400604	400605	400607	400609	400610	400612	400611	400613	400614	400615	400616	400617	400618	400619	400620	400621	400622	400623	400624	400625	400626	400627	400628	400629	400630	400631	400632	400633	400634	400635	400636	400637	400638	400639	400640	400641	400642	400643	400644	400645	400646	400647	400648	400649	400650	400651	400652	400653	400654	400655	400656	400657	400658	400659	400660	400661	400662	400663	400664	400665	400666	400667	400668	400669	400670	400671	400672	400673	400674	400675	400676	400677	400678	400679	400680	400681	400682	400683	400684	400685	400686	400687	400688	400689	400690	400691	400692	400693	400694	400695	400696	400697	400698	400699	400700	400701	400702	400703	400704	400705	400706	400707	400708	400709	400710	400711	400712	400713	400714	400715	400716	400717	400718	400719	400720	400721	400722	400723	400724	400725	400726	400727	400728	400729	400730	400731	400732	400733	400734	400735	400736	400737	400738	400739	400740	400741	400742	400743	400744	400745	400746	400747	400748	400749	400750	400751	400752	400753	400754	400755	400756	400757	400758	400759	400760	400761	400762	400763	400764	400765	400766	400767	400768	400769	400770	400771	400772	400773	400774	400775	400776	400777	400778	400779	400780	400781	400782	400783	400784	400785	400786	400787	400788	400789	400790	400791	400792	400793	400794	400795	400796	400797	400798	400799	400800	400801	400802	400803	400804	400805	400806	400807	400808	400809	400810	400811	400812	400813	400814	400815	400816	400817	400818	400819	400820	400821	400822	400823	400824	400825	400826	400827	400828	400829	400830	400831	400832	400833	400834	400835	400836	400837	400838	400839	400840	400841	400842	400843	400844	400845	400846	400847	400848	400849	400850	400851	400852	400853	400854	400855	400856	400857	400858	400859	400860	400861	400862	400863	400864	400865	400866	400867	400868	400869	400870	400871	400872	400873	400874	400875	400876	400877	400878	400879	400880	400881	400882	400883	400884	400885	400886	400887	400888	400889	400890	400891	400892	400893	400894	400895	400896	400897	400898	400899	400900	400901	400902	400903	400904	400905	400906	400907	400908	400909	400910	400911	400912	400913	400914	400915	400916	400917	400918	400919	400920	400921	400922	400923	400924	400925	400926	400927

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M - SEE ENGINE ASM MANUAL FOR QUANTITY & USAGE			ENGINE		350 CU. IN. "A" CAR																350 CU. IN. "B" CAR				350 CU. IN. SERVICE			
			ENGINE ASM	ALL	A2	A2H	S2	A4	A4H	S4	S4H	S2	A2	A2H	TYPE	A.F.A.	A.F.A.	A.F.A. (C)										
GRP.	PART NO.	PART NAME	ENGINE ASM	ALL	408684	408686	408687	408689	408690	408692	408691	408692	408691	408692	408691	408692	408691	408692	408691	408692	408691	408692	408691	408692	408691	408692	408691	408692
6F																												
	402386	PUMP ASM - OIL			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	579237	SHAFT ASM-OIL PUMP DRIVE EXTENSION			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	9421124	BOLT ASM-OIL PUMP TO BEARING CAP			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	9418548	BOLT ASM-OIL PUMP TO BEARING CAP			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	380628	PIN-DOWEL			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6G1																												
	444697	PLUG-OIL PASSAGE REAR-R.H.		1																								
	404199	PLUG-OIL PASSAGE REAR-L.H.		1																								
	557319	PLUG-OIL PASSAGE REAR-OUTER		1																								
	380401	PLUG-OIL PASSAGE FRONT-R.H.		1																								
	390895	PLUG-OIL PASSAGE FRONT-L.H.		1																								
	585927	PIN-OIL SWITCH TRANSFER HOLE		1																								
6G2																												
	409205	TUBE ASSEMBLY - OIL FILLER			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	409076	CAP ASM - OIL FILLER TUBE			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	383379	BAFFLE - OIL FILLER TUBE		1																								
6G4																												
	401548	GUIDE - OIL LEVEL INDICATOR			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6G5																												
	6438197	FILTER ASM - OIL			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	382455	GASKET - FILTER TO BLOCK			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
(A)	9418822	BOLT - FILTER TO BLOCK			3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6G7																												
	404754	OIL - ENGINE CRANKCASE FILL			M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	404753	OIL - ENGINE CRANKCASE FILL			M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
					TITLE CHART - ENGINE ASSEMBLY																SHEET 6							
					DATE 4/10/70 DR BY E.L.N. 5/1/70 CHECKED 5/2/70 APPR 5/2/70																1971				OLDSMOBILE ENGINE ASSEMBLY MANUAL			
					MANUAL REC 6																PAGE 125							
					PART NO. 408683																A-B							

OLDSMOBILE DIVISION

GENERAL MOTORS CORPORATION
LANSING -- MICHIGAN

			ENGINE		350 CU. IN. "A" CAR																350 CU. IN. "B" CAR				350 CU. IN. SERVICE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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OLDSMOBILE DIVISION

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

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			ASM	ALL	408634	QA	A2	408635	QJ	A2N	408637	QI	S2	408639	QN	AA	408640	QP	AAW	408642	QB	SA	408641	QO	SAF	408643	QC	SAW	408645	TE	S2	408646	TD	A2	408647	TC	A2N	SERVICE	ENGINE	ASM	TYPE	231132	A.F.A.	231133	A.F.A.	231275	A.F.A.	©																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
GRP.	PART NO.	PART NAME	ENGINE	ALL	408634	QA	A2	408635	QJ	A2N	408637	QI	S2	408639	QN	AA	408640	QP	AAW	408642	QB	SA	408641	QO	SAF	408643	QC	SAW	408645	TE	S2	408646	TD	A2	408647	TC	A2N	SERVICE	ENGINE	ASM	TYPE	231132	A.F.A.	231133	A.F.A.	231275	A.F.A.	©																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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GENERAL MOTORS CORPORATION
LANDING - MICHIGAN

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GENERAL MOTORS CORPORATION
LANSING — MICHIGAN

			ENGINE		350 CU. IN. "A" CAR																350 CU. IN. "B" CAR				350 CU. IN. SERVICE			
			ENG CODE		A2		A2H		S2				A4	A4H		S4	S4H											
			PROD CODE		QA		QJ		QI				QH	QP			QB	QC										
GRP.	PART NO.	PART NAME	ENGINE ASM	ALL	408654		408656		408657				408659	408660			408662	408661										
6444																												
	382802	ECCENTRIC-FUEL PUMP		1																								
(H)	6440713	PUMP ASSEMBLY-FUEL			1		1		1				1	1			1	1					1	1	1			
	312997	GASKET-FUEL PUMP			1		1		1				1	1			1	1					1	1	1			
	402720	STUD-FUEL PUMP TO BLOCK			1		1		1				1	1			1	1					1	1	1			
	9418892	NUT-FUEL PUMP TO BLOCK			1		1		1				1	1			1	1					1	1	1			
	9419275	WASHER-FUEL PUMP TO BLOCK			1		1		1				1	1			1	1					1	1	1			
	1195016	BOLT-FUEL PUMP TO BLOCK			1		1		1				1	1			1	1					1	1	1			
	405996	PIPE ASM.-FUEL PUMP TO CARB. (2-BBL.)			1		1		1														1	1	1			
	405997	PIPE ASM.-FUEL PUMP TO CARB. (4-BBL.)											1	1			1	1										
6442																												
(E)	408979	BRACKET-THROTTLE CABLE (2-BBL.)			1		1		1														1	1	1			
(F)	408982	BRACKET-THROTTLE CABLE (4-BBL.)											1	1			1	1										
	9419029	BOLT-THROTTLE CABLE BRACKET (2-BBL.)		(D)	2		2		2														2	2	2			
	401170	SPRING-THROTTLE RETURN			1		1		1				1	1			1	1					1	1	1			
(A)	399625	BRACKET-DASHPOT ASSEMBLY					1		1																1			
	409764	DASHPOT-SLOW IDLE					1		1																1			
	9419029	BOLT-BRACKET TO MANIFOLD					1		1																1			
	9418892	NUT-DASHPOT TO BRACKET					1		1																1			
									(C)																			

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

			ENGINE		350 CU. IN. "A" CAR																350 CU. IN. "B" CAR			350 CU. IN. SERVICE			
			PROD ENG CODE		A2	A2H	S2			A4	A4H	S4	S4F				S2	A2	A2H								
			PROD CODE		QA	Q1	Q1			QH	QP	QB	QD				TE	TD	TC								
GRP.	PART NO.	PART NAME	ENGINE ASM	ALL	408684	408685	408687			408697	408699	408692	408691				408621	408696	408685		SERVICE ENGINE ASM						
																					TYPE		A.F.A.	A.F.A.	A.F.A.		
6X1																											
D	400084	CAMSHAFT ASSEMBLY-ENGINE			1	1	1			1	1														1		
	402486	CAMSHAFT ASSEMBLY-ENGINE										1	1											1			
E	409717	CAMSHAFT ASSEMBLY-ENGINE															1	1	1								
	588527	PLUG-CAMSHAFT REAR BEARING CUP		1																							
	381263	SPROCKET-CAMSHAFT		1																							
	383788	SPROCKET-CAMSHAFT (OPTION)		★																							
	382888	BOLT-ECCENTRIC & CAMSHAFT SPROCKET		1																							
	382880	SPROCKET-CRANKSHAFT		1																							
	588526	KEY-CRANKSHAFT SPROCKET		1																							
	382881	CHAIN-TIMING		1																							
	401584	CHAIN-TIMING (OPTION)		★																							
	523275	LIFTER ASSEMBLY-VALVE (STD.)			16	16	16			16	16	16	16				16	16	16								
	523276	LIFTER ASSEMBLY-VALVE (.010 O.S.)			A.R.	A.R.	A.R.			A.R.	A.R.	A.R.	A.R.				A.R.	A.R.	A.R.								
	398687	ROD-VALVE PUSH			16	16	16			16	16	16	16				16	16	16								
6X13																											
	401384	ARM-VALVE ROCKER			16	16	16			16	16	16	16				16	16	16								
	391208	PIVOT-VALVE ROCKER ARM			8	8	8			8	8	8	8				8	8	8								
	9423842	BOLT-ROCKER ARM PIVOT			16	16	16			16	16	16	16				16	16	16								
	392323	COVER ASSEMBLY-VALVE			2	2	2			2	2	2	2				2	2	2								
	393573	GASKET-VALVE COVER			2	2	2			2	2	2	2				2	2	2								
	388708	BOLT-VALVE COVER TO CYLINDER HEAD			20	20	20			20	20	20	20				20	20	20								
	397132	BOLT-VALVE COVER TO CYLINDER HEAD (OPT)		★	★	★				★	★	★	★				★	★	★								
6Y1																											
	397209	BRACKET-GENERATOR			1		1			1		1	1				1	1									
	9418022	BOLT-GIN, BRACKET TO CYLINDER HEAD			3		3			3		3	3				3	3									

OLDSMOBILE DIVISION

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

			ENGINE		350 CU. IN. "A" CAR												350 CU. IN. "B" CAR			350 CU. IN. SERVICE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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NAME	ENGINE	ALL	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	40604	

028X H 231275 ADDED	158A	TITLE CHART - ENGINE ASSEMBLY	SHEET 12
028X D 106324	028X D 106324	DATE APRIL 30, 1970	1971
028X F GRP 6Y3 ENGINE	028X F 373207 REMOVED	DE BY RCV S/M	OLD SMOBILE ENGINE ASSEMBLY MANUAL
028X K USAGE ADDED	028X K 1112081 ADDED	CHECKED J. J. [Signature]	MANUAL REC. PAGE 6 131
028X J WAS 112081	028X J WAS 009075	DATE [Signature]	408683

GENERAL MOTORS CORPORATION
LANSING - MICHIGAN

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**GENERAL MOTORS CORPORATION
LANDING - MICHIGAN**

[illegible]

GENERAL MOTORS CORPORATION
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SHEET 1