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STUDEBAKER AUTOMOTIVE SALES CORPORATION
SUBSIDIARY OF

STUDEBAKER CORPORATION

SOUTH BEND 27, INDIANA

January 7, 1963

To Recipients of Studebaker AMA Specifications:

The attached are revised pages to the Studebaker - Special Equipment Specifications covering Model R-3 304.5 Cu. In. supercharged engine.

Yours truly,

H. J. Symon, Manager
Service Publications

HJS/dh

Attachment

AMA Specifications – Passenger Car

The information contained herein is prepared, distributed by, and is solely the responsibility of the automobile manufacturing company to whose products it relates. Questions concerning these specifications should be directed to the manufacturer whose address is shown below. This uniform specification form was developed by the automobile manufacturing companies under the auspices of the Automobile Manufacturers Association.

MANUFACTURER	STUDEBAKER AUTOMOTIVE SALES CORPORATION	CAR NAME	STUDEBAKER Special Equipment Specifications
MAILING ADDRESS	635 S. MAIN STREET SOUTH BEND 27, INDIANA	MODEL YEAR 1963	ISSUED: July 23, 1962 REVISED (•) Nov. 15, 1962

NOTES:

1. The Specifications herein are those in effect at date of compilation and are subject to change without notice by the manufacturer.
2. UNLESS OTHERWISE INDICATED:
   a. Specifications apply to standard models without optional equipment. Significant deviations are noted.
   b. Nominal design dimensions are used throughout these specifications.

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BODY—TYPES AND STYLE NAMES— Body type, number of passenger & style names; use manufacturer's code for series & body style.

SUPPLEMENTARY INFORMATION COVERING SPECIAL MODEL R-3, 304.5 CU. IN. SUPERCHARGED ENGINE AND OTHER COMPONENTS AVAILABLE AS SPECIAL ORDER OPTIONS ON LARK, HAWK, CRUISER AND AVANTI MODELS.

(SUPPLEMENTS 1963 AMA SPECIFICATIONS)

AMA Specifications–Passenger Car

MAKE OF CAR STUDEBAKER **MODEL YEAR** 1963 **DATE ISSUED** 7-23-62 **REVISED** (•) 11-15-62

MODEL R-3 ENGINE

ENGINE—GENERAL

Type, no. cyls., valve arr.		V8 - Valve in Head
Bore and stroke (nominal)		3-21/32 x 3-5/8
Piston displacement, c u. in.		304.5
Bore spacing (C/L to C/L)		4.5"
No. system (front to rear)	L. Bank	1-3-5-7
	R. Bank	2-4-6-8
Firing order		1-8-4-3-6-5-7-2
Compres. ratio (nominal)		9.75 Will Vary According to Tolerance
Cylinder Head Material		Cast Iron
Cylinder Block Material		Cast Iron
Cylinder Sleeve-Wet, dry, none		None
Number of mounting points	Front	2
	Rear	1
Engine installation angle		5^{o} - 49'
Taxable horsepower $\frac{\text{Dia.}^2 \times \text{No. Cyl.}}{2.5}$		42.5
Published max. bhp* @ eng. RPM		305 @ 5200 RPM and 6 lbs. Manifold Pressure
Published max. torque* (lb. ft. @ RPM)		320 @ 4000 RPM
Recommended fuel regular - premium		Premium
Idle speed (spec. neutral or drive)	Manual	N.A.
	Automatic	N.A.

ENGINE—PISTONS

Material			Aluminum - 2018T6
Description and finish			(Tru-Forged) Tin-Plated
Weight (piston only) oz.			17.60
Clearance (limits)	Top land		.038 - .040
	Skirt	Top	Selective Fit
		Bottom	Selective Fit
Ring groove depth	No. 1 ring		N.A.
	No. 2 ring		N.A.
	No. 3 ring		N.A.
	No. 4 ring		

* Max. bhp (brake horsepower) and max. torque corrected as defined by SAE Engine Test Code.

1. Combustion chambers and valve port openings are hand polished and controlled.
2. Combustion chamber volumes are hand matched to each other and are 61 $\pm$ 3 cc.
3. Piston deck heights are .023 $\pm$ .011.

AMA Specifications – Passenger Car

MAKE OF CAR STUDEBAKER **MODEL YEAR** 1963 **DATE ISSUED** 7-23-62 **REVISED (•)** 11-15-62

POWER TEAMS

(Indicate whether standard or optional)

MODEL AVAILABILITY	ENGINE					TRANSMISSION	AXLE RATIO (Std. first)	
	Displ. cu. in.	Carburetor	Compr. Ratio	BHP @ RPM	Torque @ RPM			
Optional On Larks, Cruiser, Hawk & Avanti Supercharged	304.5	One 4 Bbl.	9.75	305 @ 5200 RPM & 6 lbs Man. Press.	320 @ 4000	T-10C and T-10D 4-Speed Manual and Automatic Transmission	2.53 2.76 2.87 3.07 3.31 3.54 3.73 3.92 4.09 4.27 4.55 4.89 5.38	All Optional

AMA Specifications – Passenger Car

MAKE OF CAR STUDEBAKER MODEL YEAR 1963 DATE ISSUED 7-23-62 REVISED (•) 11-15-62

MODEL R-3 EINGINE

ENGINE—RINGS

Function (top to bottom)	No. 1, oil or comp.	Compression
	No. 2, oil or comp.	Compression
	No. 3, oil or comp.	Oil
	No. 4, oil or comp.	---
Compression	Description – material, type, coating, etc.	Top-Cast Iron Chrome Plated 2nd-Cast Iron Granoseal
	Width	.078"
	Gap	.030" Top - .030" - 2nd
Oil	Description – material, type, coating, etc.	Chrome Plated Steel Rail
	Width	.187"
	Gap	.015 to .055
Expanders		Behind Oil Ring Only

ENGINE—PISTON PINS

Material			C. D. Steel - SAE 8620
Length			3-1/16"
Diameter			.875"
Type	Locked in rod, in piston, floating, etc.		Shrink Fit In Rod
	Bushing	In rod or piston	None
		Material	---
Clearance	In piston		.0001"-.0003" - Selective Fit
	In rod		None
Direction & amount offset in piston			1/16" Toward Thrust Side

ENGINE—CONNECTING RODS

Material		Special D. F. Steel - C-1141
Weight (oz.)		23.71 oz. (Clamped In Rod)
Length (center to center)		6.625"
Bearing	Material & Type	Steel Back - Trimetal Aluminum (Steel Back - Trimetal Copper-Lead)
	Overall length	13/16"
	Clearance (limits)	.00125 - .00375
	End play	.008" - .013"

AMA Specifications – Passenger Car

MAKE OF CAR STUDEBAKER MODEL YEAR 1963 DATE ISSUED 7-23-62 REVISED (•) 12-28-62

MODEL R-3 ENGINE

ENGINE—RINGS

Function (top to bottom)	No. 1, oil or comp.	Compression
	No. 2, oil or comp.	Compression
	No. 3, oil or comp.	Oil
	No. 4, oil or comp.	---
Compression	Description - material, type, coating, etc.	Top-Cast Iron Chrome Plated 2nd-Cast Iron Granoseal
	Width	.078"
	Gap	.030" Top - .030" - 2nd
Oil	Description - material, type, coating, etc.	Chrome Plated Steel Rail
	Width	.187"
	Gap	.015 to .055
Expanders		Behind Oil Ring Only

ENGINE—PISTON PINS

Material			C. D. Steel - SAE 8620
Length			3-1/16"
Diameter			.875"
Type	Locked in rod, in piston, floating, etc.		Shrink Fit In Rod (Clamped In Rod - Opt.) •
	Bushing	In rod or piston	None
		Material	---
Clearance	In piston		.0001"-.0003" - Selective Fit
	In rod		None
Direction & amount offset in piston			1/16" Toward Thrust Side

ENGINE—CONNECTING RODS

Material		Special D. F. Steel - C-1141
Weight (oz.)		23.71 oz. (Clamped In Pin) •
Length (center to center)		6.625"
Bearing	Material & Type	Steel Back - Trimetal Aluminum (Steel Back - Trimetal Copper-Lead)
	Overall length	13/16"
	Clearance (limits)	.00125 - .00375
	End play	.008" - .013"

AMA Specifications–Passenger Car

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MODEL R-3 ENGINE

ENGINE—CRANKSHAFT

Material			D.F. Steel - SAE 1045
Vibration damper type			Rubber Mounted Inertia Member
End thrust taken by bearing (No.)			#1
Crankshaft end play			.003" to .006"
Main bearing	Material & type		Front & Rear - Steel Back Babbitt Lined #2-3 & 4 - Steel Back Trimetal Aluminum *
	Clearance		.0018 - .0043
	Journal dia. and bearing overall length	No. 1	2.500" - 1.309"
		No. 2	2.500" - .906"
		No. 3	2.500" - .906"
		No. 4	2.500" - .906"
		No. 5	2.500" - 1.546"
		No. 6	---
		No. 7	---
	Dir. & amt. cyl. offset		None
Crankpin journal diameter			1.99825" - 1.99925"

ENGINE—CAMSHAFT

Location			Cylinder Block - Center
Material			Alloy - Cast Iron
Bearings	Material		Steel Back - Babbitt Lined
	Number		5
Type of Drive	Gear or chain		Gear
	Crankshaft gear or sprocket material		Cast Iron
	Camshaft gear or sprocket material		Aluminum
	Timing chain	No. of links	None
		Width	None
		Pitch	None

ENGINE—VALVE SYSTEM

Hydraulic lifters (Std, opt, NA)		N.A.
Valve rotator, type (intake, exhaust)		None
Rocker ratio		1.5 to 1
Operating tappet clearance (indicate hot or cold)	Intake	.023" - .025" Hot .025" - .027" Cold
	Exhaust	.023" - .025" Hot .025" - .027" Cold
Timing marks on flywheel, damper, other		Damper

* Steel Back Type Trimetal Copper-Leak, Optional

(Continued)

AMA Specifications–Passenger Car

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MODEL R-3 ENGINE

ENGINE—VALVE SYSTEM (cont.)

Timing	Intake	Opens (°BTC)	28°	Additional Camshaft Timings Optional
		Closes (°ABC)	80°	
		Duration - deg.	288°	
	Exhaust	Opens (°BBC)	80°	
		Closes (°ATC)	28°	
		Duration - deg.	288°	
	Valve opening overlap		56°	
Intake	Material		Sil. XBE - (HNV6)	
	Overall length		5-5/32"	
	Actual overall head dia.		1-7/8"	
	Angle of seat & face		45°	
	Seat insert material		None	
	Stem diameter		11/32"	
	Stem to guide clearance		.0015" - .0035"	
	Lift (@ zero lash)		.400"	
	Outer spring press. and length	Valve closed (lb. @ in.)	67-75 @ 2.031"	
		Valve open (lb. @ in.)	148-160 @ 1.631"	
	Inner spring press. and length	Valve closed (lb. @ in.)	None	
		Valve open (lb. @ in.)	None	
Exhaust	Material		SAE EV8 (21-4N) - (Stellite Faced)	
	Overall length		5-5/32"	
	Actual overall head dia.		1-5/8"	
	Angle of seat & face		45°	
	Seat insert material		None	
	Stem diameter		11/32"	
	Stem to guide clearance		.0015" - .0035"	
	Lift (@ zero lash)		.400"	
	Outer spring press. and length	Valve closed (lb. @ in.)	67-75 @ 2.031"	
		Valve open (lb. @ in.)	148-160 @ 1.631"	
	Inner spring press. and length	Valve closed (lb. @ in.)	None	
		Valve open (lb. @ in.)	None	

ENGINE—LUBRICATION SYSTEM

Type of lubrication (splash, pressure, nozzle)	Main bearings	Full Pressure
	Connecting rods	Full Pressure
	Piston pins	Splash
	Camshaft bearings	Full Pressure
	Tappets	Full Pressure
	Timing gear or chain	Full Pressure
	Cylinder walls	Directed Jet

(Continued)

AMA Specifications–Passenger Car

MAKE OF CAR STUDEBAKER MODEL YEAR 1963 DATE ISSUED 7-23-62 REVISED (•)12-28-62

MODEL R-3 ENGINE

ENGINE—VALVE SYSTEM (cont.)

Timing	Intake	Opens (°BTC)	28°	Additional Camshaft Timings Optional
		Closes (°ABC)	80°	
		Duration - deg.	288°	
	Exhaust	Opens (°BBC)	80°	
		Closes (°ATC)	28°	
		Duration - deg.	288°	
	Valve opening overlap		56°	
Intake	Material		Sil. XBE - (HNV6)	
	Overall length		5-5/32"	
	Actual overall head dia.		1-7/8"	
	Angle of seat & face		45°	
	Seat insert material		None	
	Stem diameter		11/32"	
	Stem to guide clearance		.0015" - .0035"	
	Lift (@ zero lash)		13/32"	•
	Outer spring press. and length	Valve closed (lb. @ in.)	67-83 @ 2.031"	•
		Valve open (lb. @ in.)	150-172 @ 1.631"	•
	Inner spring press. and length	Valve closed (lb. @ in.)	None	
		Valve open (lb. @ in.)	None	
Exhaust	Material		SAE EV8 (21-4N) - (Stellite Faced)	
	Overall length		5-5/32"	
	Actual overall head dia.		1-5/8"	
	Angle of seat & face		45°	
	Seat insert material		None	
	Stem diameter		11/32"	
	Stem to guide clearance		.0015" - .0035"	
	Lift (@ zero lash)		13/32"	•
	Outer spring press. and length	Valve closed (lb. @ in.)	67-83 @ 2.031"	•
		Valve open (lb. @ in.)	150-172 @ 1.631"	•
	Inner spring press. and length	Valve closed (lb. @ in.)	None	
		Valve open (lb. @ in.)	None	

ENGINE—LUBRICATION SYSTEM

Type of lubrication (splash, pressure, nozzle)	Main bearings	Full Pressure
	Connecting rods	Full Pressure
	Piston pins	Splash
	Camshaft bearings	Full Pressure
	Tappets	Full Pressure
	Timing gear or chain	Full Pressure
	Cylinder walls	Directed Jet

(Continued)

AMA Specifications – Passenger Car

MAKE OF CAR STUDEBAKER MODEL YEAR 1963 DATE ISSUED 7-23-62 REVISED (•) 11-15-62

MODEL R-3 ENGINE

ENGINE—LUBRICATION SYSTEM (cont.)

Oil pump type	Spur Gear
Normal oil pressure (lb. @ engine rpm)	30 @ 2000
Oil pressure sending unit (elect. or mech.)	Mechanical
Type oil intake (floating, stationary)	Stationary
Oil filter system (full flow, partial, other)	Full Flow
Filter replacement (element, complete)	Complete
Capacity of crankcase, less filter-refill (qt.)	6 Std. (7-10 Optional)
Oil grade recommended (SAE viscosity and temperature range)	$+32^{\circ}$ - SAE 40; $+10^{\circ}$ - SAE 20; -10° - SAE 10W; Below -10° - SAE 5W
Engine Service Requirement (MM, MS, etc.)	MS alone or in combination with MM, ML, DG

ENGINE—EXHAUST SYSTEM

Type (single, single with cross-over, dual, other)		Dual
Muffler No. & type (reverse flow, straight thru, separate resonator)		2 - Straight Thru - Glass Wool Pack
Exhaust pipe dia. (O.D., wall thickness)	Branch	---
	Main	2"
Tail pipe diameter (O.D. & wall thickness)		2"

ENGINE—CRANKCASE VENTILATION SYSTEM

Type (ventilates to atmos., induction system, other)		Standard	Atmosphere
		Optional	---
Control unit	Make and model		None
	Location		---
	Energy source (manifold vacuum, carburetor air stream, other)		---
	Control method (variable orifice, fixed orifice, other)		---
Complete system	Discharges (to intake manifold, carb. air intake, air cleaner intake, other		Atmosphere
	Air inlet (breather cap, carburetor air cleaner, other)		Breather Caps
	Flame arrestor (screen, check valve, other)		---

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MODEL R-3 ENGINE

ENGINE—LUBRICATION SYSTEM (cont.) *

Oil pump type	Spur Gear
Normal oil pressure (lb. @ engine rpm)	30 @ 2000
Oil pressure sending unit (elect. or mech.)	Mechanical
Type oil intake (floating, stationary)	Stationary
Oil filter system (full flow, partial, other)	Full Flow
Filter replacement (element, complete)	Complete
Capacity of crankcase, less filter-refill (qt.)	6 Std. (7-10 Optional)
Oil grade recommended (SAE viscosity and temperature range)	$+32^{\circ}$ - SAE 40; -10° - SAE 10W; $+10^{\circ}$ - SAE 20; Below -10° - SAE 5W
Engine Service Requirement (MM, MS, etc.)	MS alone or in combination with MM, ML, DG

ENGINE—EXHAUST SYSTEM

Type (single, single with cross-over, dual, other)		Dual
Muffler No. & type (reverse flow, straight thru, separate resonator)		2 - Straight Thru - Glass Wool Pack
Exhaust pipe dia. (O.D., wall thickness)	Branch	---
	Main	2"
Tail pipe diameter (O.D. & wall thickness)		2"

ENGINE—CRANKCASE VENTILATION SYSTEM

Type (ventilates to atmos., Induction system, other)		Standard	Atmosphere
		Optional	---
Control unit	Make and model		None
	Location		---
	Energy source (manifold vacuum, carburetor air stream, other)		---
	Control method (variable orifice, fixed orifice, other)		---
Complete system	Discharges (to intake manifold, carb. air intake, air cleaner intake, other		Atmosphere
	Air inlet (breather cap, carburetor air cleaner, other)		Breather Caps
	Flame arrestor (screen, check valve, other)		---

* Oil Cooler - Optional

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MODEL R-3 ENGINE

ENGINE—FUEL SYSTEM

(See Supplement to Page 8 for Details of Fuel Injection, Supercharger, etc. if used)

Induction type: Carburetor, fuel injection, supercharger.			Carburetor - Supercharged
Fuel Tank	Capacity (gals.)		21 Gal. - Std. 26.5 Gal. - Optional **
	Filler location		Left Side - Rear Quarter Panel
Fuel Pump	Type (elec. or mech.)		Mechanical *
	Locations		Left Front of Engine
	Pressure range		N.A.
Vacuum booster (std., optional, none)			None
Fuel Filter	Type		Pleated Paper
	Locations		In Line Between Pump & Carburetor
Carburetor	Choke type		Automatic
	Intake manifold heat control (exhaust or water)		Exhaust
	Air clnr. type	Standard	Plasticized Paper
		Optional	None

CARBURETOR SUPPLEMENTARY INFORMATION

Model Usage	Engine Displ.	Transmission	Carburetors		No. Used and Type	Barrel Size
			Make	Model		
R3 Engine	304.5	4-Speed and Automatic	Carter	AFB	One 4 Bbl.	1-7/16 Pri. 1-11/16 Sec.

* Booster Electric Fuel Pump - Optional - Mounts Under Gas Tank

** On Avanti Only - 18 Gal. on Lark, Cruiser, and Hawk

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MODEL R-3 ENGINE

ENGINE—COOLING SYSTEM

Type system (pressure, pressure vented, atmospheric, other)			Pressure - Atmospheric Vented
Radiator cap relief valve pressure			12 - 15 P.S.I.
Circulation thermostat	Type (choke, bypass)		Choke
	Starts to open at (°F)		170° F.
Water pump	Type (centrifugal, other)		Centrifugal
	GPM @ 1000 pump rpm		
	Number of pumps		1
	Drive (V-belt, other)		V-Belt
	Bearing type		Sealed Double Row-Ball
By-pass recirculation type (internal, external)			Internal
Radiator core type (cellular, tube and fin, other)			Cellular - Tubular - Cross-Flow
Cooling system capacity	With heater (qt.)		18 Qts.
	Without heater (qt.)		17 Qts.
	Opt. equipment-specify (qt.)		None
Water jackets full length of cylinder (yes, no)			Yes
Water all around cylinder (yes, no)			Yes
Radiator hose	Lower	Number and type (molded, straight)	One - Moulded
		Inside diameter	1-3/4"
	Upper	Number and type (molded, straight)	One - Moulded
		Inside diameter	1-3/4"
	By-pass	Number and type (molded, straight)	None
		Inside diameter	----
Fan	Number of blades & Spacing		5 Blades - (65° - 65° - 92° - 46° - 92°)
	Diameter		14" Std. - 17" Opt.
	Ratio-fan to crankshaft rev.		Various
	Fan cutout type		2500 - (Viscous Drive)
	Bearing type		Double Row - Ball
*Drive belts (indicate belt used by letter)	Fan		D
	Generator		D
	Water Pump		D
	Power Steering		B
	Air Conditioning		
	Supercharger		E

* Drive Belt Dimensions	B	D	E
Angle of V	38°	38°	38°
Nominal length (SAE)			
Width	15/32"	15/32"	15/32"

AMA Specifications – Passenger Car

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MODEL R-3 ENGINE

ELECTRICAL—SUPPLY SYSTEM

Battery	Make and Model		Willard - HDD-3EE
	Voltage Rtg. & Total Plates		12V.
	SAE Designation & Amp Hr. Rtg		60 Amp. Hr.
	Location		Under Hood - Left Fender
	Terminal grounded		Negative
Alternator	Make		Electric Auto-Lite Co.
	Model		ALE-5003
	Type		DC - Diode Rectification
	Ratio—Gen. to Cr/s rev.		Various
	Gen. cut-in (hot)—engine rpm		900 Alternator RPM
Regulator	Make		Electric Auto-Lite Co.
	Model		VBV 6221A
	Type		Vibrating
	Cutout relay	Closing voltage @ generator rpm	N.A.
		Reverse current to open	None
	Regulated	Voltage	14.0-14.4 Upper Contacts
		Current	None
	Voltage test conditions	Temperature	70°
		Load	10 Amps.
		Other	20 Min. @ 2000 Alternator RPM

ELECTRICAL—STARTING SYSTEM

Starting motor	Make		Electric Auto-Lite Co.
	Model		MDU-7025
	Rotation (drive end view)		Clockwise
	Engine cranking speed		160
	Test conditions		Normal Engine Operating Temp.
	Lock test	Amps	435
		Volts	60
		Torque (lb. ft.)	11
	No load test	Amps	55
		Volts	10
		RPM (min.)	5200
Motor control	Switch (solenoid, manual)		Solenoid
	Starting procedure		1. Rotate ignition key clockwise to starting position 2. When engine starts, permit the key to return to ignition "ON" position.

(Continued)

AMA Specifications – Passenger Car

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MODEL R-3 ENGINE

ELECTRICAL—STARTING SYSTEM (cont.)

Motor Drive	Engagement type		Bendix - Folo-thru
	Pinion meshes (front, rear)		Front
	Number of teeth	Pinion	9
		Flywheel	162
	Flywheel tooth face width		.375"

ELECTRICAL—IGNITION SYSTEM - Prestolite Transigniter Model 201

Coil	Make		Prestolite
	Model		200826
	Amps	Engine stopped	10
		Engine idling	4.5 - 5.0
Distributor	Make		Electric Auto-Lite - Dual Breaker
	Model		IBB 4110
	Cent'fgal adv. in crankshaft degrees @ engine rpm (nominal)	Start (rpm)	---
		Intermediate points deg. @ rpm	---
		Max deg. @ rpm	---
	Vacuum adv. in crankshaft degrees @ in. Hg. (nominal)	Start (in Hg)	None
		Intermediate points, deg @ in Hg	
		Max. deg. in. Hg.	
	Breaker gap (in.)		.011" - .016"
	Cam angle (deg.)		39° - ±3°
	Breaker arm tension (oz.)		21 - 25 oz.
Timing	Crankshaft deg. @ rpm.		26° @ 4000 RPM
	Mark location		On Damper Flywheel
	Cylinder numbering system (see page 2)		L. Bank-1-3-5-7 R. Bank-2-4-6-8
	Firing order (see page 2)		1-8-4-3-6-5-7-2
Spark Plug	Make and model		Normal Use Champion J-9Y; Champion J-61Y or J-79 - Competition
	Thread (mm)		14
	Tightening torque (lb. ft.)		24-30
	Gap		.033" - .038"
Cable	Conductor type		Stainless Steel
	Insulation type		Silicon
	Spark plug protector		Applied or Molded Terminal Cover

ELECTRICAL—SUPPRESSION

Locations & type	.5 MFD Condensers at Ignition Coil, Generator Armature and Voltage Regulator, with Radio Only. 10,000 OHM - In Distributor Rotor - Ground at Oil Pipe.

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MODEL R-3 ENGINE

Pages 12-14 were related to electrical bulbs and were not included in this submission

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MODEL R-3 ENGINE COMPONENTS

DRIVE UNITS—CLUTCH (Manual Transmission)

Make & type		Borg & Beck Semi-Centrifugal
Type pressure plate springs		Coil
Effective plate pressure (lb.)		2217
No. of clutch driven discs		1
Clutch facing	Material	Woven - Molded
	Outside & inside dia.	10-1/2 x 6-1/2
	Total eff. area (sq.in.)	106.8
	Thickness	.135
	Engagement cushioning method	Plate Cushion Springs
Release bearing	Type & method of lubrication	Single Row Ball - Prelubricated
Torsional damping	Methods: springs, friction material	Coil Springs & Steel Washers

DRIVE UNITS—TRANSMISSIONS

Manual (std. or opt.)	4-Speed - Std.
Manual with overdrive (std. or opt.)	N.A.
Automatic (std. or opt.)	N.A.

DRIVE UNITS—MANUAL TRANSMISSION

Number of forward speeds			4-Speed - Warner AS6-T10D
Transmission ratios	In first		2.54:1
	In second		1.89:1
	In third		1.51:1
	In fourth		1.00:1
	In reverse		2.61:1
Synchronous meshing, specify gears			1st, 2nd, 3rd, 4th
Shift lever location			Floor
Lubricant	Capacity (pt.)		2.5
	Type recommended		Mineral Gear Lubricant
	SAE viscosity number	Summer	SAE 80
		Winter	SAE 80
		Extreme cold	SAE 80

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MODEL R-3 ENGINE COMPONENTS

DRIVE UNITS—CLUTCH (Manual Transmission)

Make & type		Borg & Beck Semi-Centrifugal
Type pressure plate springs		Coil
Effective plate pressure (lb.)		2217
No. of clutch driven discs		1
Clutch facing	Material	Woven - Molded
	Outside & inside dia.	10-1/2 x 6-1/2
	Total eff. area (sq.in.)	106.8
	Thickness	.135
	Engagement cushioning method	Plate Cushion Springs
Release bearing	Type & method of lubrication	Single Row Ball - Prelubricated
Torsional damping	Methods: springs, friction material	Coil Springs & Steel Washers

DRIVE UNITS—TRANSMISSIONS

Manual (std. or opt.)	4-Speed T10D - Std. -- 4-Speed T10C - Opt. ●
Manual with overdrive (std. or opt.)	N.A.
Automatic (std. or opt.)	Optional ●

DRIVE UNITS—MANUAL TRANSMISSION

			Standard	Optional
Number of forward speeds			4-Speed - Warner AS6-T10D	Warner AS17-T10C ●
Transmission ratios	In first		2.54:1	2.20:1
	In second		1.89:1	1.66:1
	In third		1.51:1	1.31:1
	In fourth		1.00:1	1.00:1
	In reverse		2.61:1	2.26:1
Synchronous meshing, specify gears			1st, 2nd, 3rd, 4th	
Shift lever location			Floor	
Lubricant	Capacity (pt.)		2.5	
	Type recommended		Mineral Gear Lubricant	
	SAE viscosity number	Summer	SAE 80	
		Winter	SAE 80	
		Extreme cold	SAE 80	

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MODEL R-3 ENGINE COMPONENTS

DRIVE UNITS—MANUAL TRANSMISSION WITH OVERDRIVE

For transmission data see manual transmission section

Overdrive	Type (planetary or other)			
	Manual lockout (yes, no)			
	Downshift acelerator control (yes, no)			
	Minimum cut-in speed			
	Gear ratio			
	Lubricant	Capacity (pt.) (Overdrive only)		
		Separate filler (yes, no)		
		Type recommended		
		SAE viscosity number	Summer	
			Winter	
			Ext. cold	

DRIVE UNITS—AUTOMATIC TRANSMISSION

Trade name		Warner AS2-10
Type describe		Torque Converter and Compound Planetary
Method of Selection (Lever, Push Button or other)		Floor - Lever
Selector Pattern		P-R-N-D-2-1
List gear ratios Selector Pattern and indicate which are used in each selector position		1 - 1st gear - Torque Converter x 2.40:1 2 and D - 2nd gear - Torque Converter x 1.47:1 D - 3rd gear - Torque Converter x 1.00:1 R - Reverse - Torque Converter x 2.00:1
Max. upshift speeds—drive range		82 with 3.31 axle; 72 with 3.73 axle
Max. kickdown speeds—drive range		73 with 3.31 axle; 64 with 3.73 axle
Torque convertor	Number of elements	3
	Max. ratio at stall	2.25:1 @ 2200 RPM
	Type of cooling (air, water)	Forced Air Plus Water
Lubricant	Capacity—refill (pt.)	18
	Type recommended	Type "A" Automatic Transmission Lubricant
Special transmission features		Manual selection of 1st and 2nd gear, inhibited on downshift: starts in 2nd gear with automatic upshift to 3rd in 'D'

DRIVE UNITS—PROPELLER SHAFT

Number used		
Type (exposed, torque tube)		
Outer diameter x length* x wall thickness	Manual transmission	
	Overdrive transmission	
	Automatic transmission	

*Center to center of universal joints, or to centerline of rear attachment.

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MODEL R-3 ENGINE COMPONENTS

DRIVE UNITS—PROPELLER SHAFT (cont.)

Intermediate bearing	Type (plain, anti-friction)		
	Lubrication (fitting, prepack)		
Universal joints	Make		
	Number used		
	Type (ball and trunnion, cross, other)		
	Bearing	Type (plain, anti-friction)	
		Lubric. (fitting, prepack)	
Drive taken through (torque tube or arms, springs)			
Torque taken through (torque tube or arms, springs)			

DRIVE UNITS—REAR AXLE

Description (see instructions)			Hypoid - Semi-Floating - Model 44-1
Limited Slip differential, type			Twin-Traction Limited Slip - Model 44-1 Opt.
Drive Pinion Offset			1.5
No. of differential pinions			2 - Std. Axle - 4 on Twin-Traction
Gear ratios (Std. equip.)	Manual transmission 4-Speed		See Page Three
	Overdrive transmission		None
	Automatic transmission		None
Ring gear O.D. (std. ratio)			8-1/2
Pinion adjustment (shim, other)			Shim
Pinion bearing adj. (shim, other)			Shim
Wheel bearing type			Ball or Tapered Roller
Lubricant	Capacity (pt.)		3
	Type recommended		Hypoid Lubricant
	SAE viscosity number	Summer	SAE 90 } For Twin-Traction use
		Winter	SAE 90 } Studebaker
		Extreme cold	SAE 80 } Special Lubricant

REAR AXLE RATIO TOOTH COMBINATIONS

(See page 3 for axle ratio usage)

Axle ratio		
No. of teeth	Pinion	
	Ring gear	

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MODEL R-3 ENGINE COMPONENTS

Pages 18-19 were related to Wheels, Tires & Brakes and were not included in this submission

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MODEL R-3 ENGINE COMPONENTS

SUSPENSION FRONT (cont.)

Spring	Type	Independent Coil Springs
	Material	SAE 9260 or 5160 Steel
	Size (coil design height & I.D.; bar length x dia.	8-7/8 x 4.1875 x 136.0 x .650
	Spring rate (lb. per in.)	280
	Rate at wheel (lb. per in.)	130 (Including Support Arm Bushings)
	Design load (lb. @ design height)	1565 @ 8-7/8
Stabilizer	Type (link, linkless, frameless)	Link
	Material & bar diameter	SAE 1065 - .750"

STEERING

Mechanical (std., opt., NA)				
Power (std., opt., NA)				
Wheel diameter				
Turning diameter	Outside front	Wall to wall (l. & r.)		
		Curb to curb (l. & r.)		
	Inside rear	Wall to wall (l. & r.)		
		Curb to curb (l. & r.)		
Outside wheel angle with inside wheel at 20°				
Mechanical	Gear	Type		
		Make		
		Ratios	Gear	
			Overall	
	No. wheel turns			
Power	Type (coxial, linkage, etc.)			
	Make			
	Trade name			
	Gear	Type		
		Ratios	Gear	
			Overall	
	Pump driven by			
	Number wheel turns			
Linkage	Type			
	Location (front or rear of wheels, other)			
	Drag link (trans. or longit.)			
	Tie rods (one or two)			

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MODEL R-3 ENGINE COMPONENTS

SUSPENSION FRONT (cont.)

Spring	Type	Independent Coil Springs
	Material	SAE 9260 or 5160 Steel
	Size (coil design height & I.D.; bar length x dia.	8-7/8 x 4.1875 x 134.0 x .650
	Spring rate (lb. per in.)	325
	Rate at wheel (lb. per in.)	130 (Including Support Arm Bushings)
	Design load (lb. @ design height)	1565 @ 8-7/8
Stabilizer	Type (link, linkless, frameless)	Link
	Material & bar diameter	SAE 1065 - .750"

STEERING

Mechanical (std., opt., NA)				
Power (std., opt., NA)				
Wheel diameter				
Turning diameter	Outside front	Wall to wall (l. & r.)		
		Curb to curb (l. & r.)		
	Inside rear	Wall to wall (l. & r.)		
		Curb to curb (l. & r.)		
Outside wheel angle with inside wheel at 20°				
Mechanical	Gear	Type		
		Make		
		Ratios	Gear	
			Overall	
	No. wheel turns			
Power	Type (coaxial, linkage, etc.)			
	Make			
	Trade name			
	Gear	Type		
		Ratios	Gear	
			Overall	
	Pump driven by			
	Number wheel turns			
Linkage	Type			
	Location (front or rear of wheels, other)			
	Drag link (trans. or longit.)			
	Tie rods (one or two)			

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MODEL R-3 ENGINE COMPONENTS

STEERING (cont)

Steering Axis	Inclination at camber (deg.)		
	Bearings (type)	Upper	
		Lower	
		Thrust	
Wheel alignment (range and preferred)	Caster (deg.)		
	Camber (deg.)		
	Toe-in (outside tread-inches)		
Steering spindle & joint type			
Wheel spindle	Diameter	Inner bearing	
		Outer bearing	
	Thread size		
	Bearing type		

SUSPENSION—REAR

Type and description				Semi-Elliptic Rear Springs - Asymmetric
Drive and torq. taken through (see page 17)				Rear Springs and Radius Rods
Spring	Type			Semi-Elliptic - Leaf
	Material			SAE 5160 or 9260
	Size (length x width, coil design height and I.D.; bar length & dia.)			51" x 2-1/2"
	Spring rate (lb. per in.)			135
	Rate at wheel (lb. per in.)			170
	Design load (lb. at design height)			700 @ 2-1/2" Negative Camber
	Mounting insulation type			Rubber Bushings
	If leaf	No. of leaves		6
		Inserts	Type and size	Button Type - 2.38 x .080 Hexagon
			Material	Polyethlene with Graphite
		Shackle (comp. or tens.)		Compression
Stabilizer	Type (link, linkless, frameless)			Link
	Material			SAE 1065
Track bar type				None