

AUTOMOTIVE & TRUCK TRANSMISSIONS

**WARNER GEAR DIVISION
BORG-WARNER CORP.
MUNCIE, INDIANA
U. S. A.**

WARNER GEAR DIVISION
Borg-Warner Corporation
Muncie, Indiana

GENERAL DESCRIPTION OF TRANSMISSION MODELS

<u>Model</u>	<u>Control</u>	<u>Speeds</u>	<u>Ratios</u>	<u>Torque Capacity in Lbs. Ft.</u>	<u>Clutch Housing Mountings</u>	<u>Power Take-Off Mountings</u>
**T9 (Truck)	Remote or Cane	4 Not Synchro.	1st 6.40 to 1.0 2nd 3.09 to 1.0 3rd 1.69 to 1.0 4th 1.0 to 1.0 Rev. 7.82 to 1.0	185	S.A.E. #3 S.A.E. #4 S.A.E. #5	1 Right S.A.E. Regular Duty Type Opening
**T9A (Truck)	Remote or Cane	4 Not Synchro.	1st 5.90 to 1.0 2nd 3.09 to 1.0 3rd 1.69 to 1.0 4th 1.0 to 1.0 Rev. 7.21 to 1.0	185	S.A.E. #3 S.A.E. #4 S.A.E. #5	1 Right S.A.E. Regular Duty Type Opening
T10 (Pass.Car)	Remote	4 Synchro.	1st 2.20 to 1.0 2nd 1.66 to 1.0 3rd 1.31 to 1.0 4th 1.0 to 1.0 Rev. 3.36 to 1.0		Special for Customer	None
**T9-L2 (Truck)	Same as T9 except also full reversing					1 Right S.A.E. Regular Duty Type Opening
T92 (Pass. Car & Indus.)	Cane	3 Not Synchro.	1st 3.294 to 1.0 2nd 1.721 to 1.0 3rd 1.0 to 1.0 Rev. 3.294 to 1.0	50	Special for Customer	None
T96 (Pass. Car & Indus.)	Remote or Cane	3 Synchro.	1st 2.605 to 1.0 2nd 1.630 to 1.0 3rd 1.0 to 1.0 Rev. 3.536 to 1.0	150	Special for Customer	None
T96-R10B (Pass.Car)	Remote	3 Synchro. and Overdrive	1st 2.605 to 1.0 2nd 1.630 to 1.0 3rd 1.0 to 1.0 O.D. .7 to 1.0 Rev. 3.536 to 1.0	150	Special for Customer	None

<u>Model</u>	<u>Control</u>	<u>Speeds</u>	<u>Ratios</u>	<u>Torque Capacity in Lbs.Ft.</u>	<u>Clutch Housing Mountings</u>	<u>Power Take-Off Mountings</u>
T90B (Truck)	Remote	3 Synchro.	1st 3.334 to 1.0 2nd 1.35 to 1.0 3rd 1.0 to 1.0 Rev. 4.53 to 1.0	165	Special For Customer	None
T90C (Truck)	Cane	3 Synchro.	1st 2.798 to 1.0 2nd 1.551 to 1.0 3rd 1.0 to 1.0 Rev. 3.798 to 1.0	165	Special For Customer	None
T90J (Truck)	Cane	3 Synchro.	1st 2.798 to 1.0 2nd 1.551 to 1.0 3rd 1.0 to 1.0 Rev. 3.798 to 1.0	165	Special For Customer	None
T90B-R10B (Truck)	Remote	3 Synchro. and Overdrive	1st 3.334 to 1.0 2nd 1.85 to 1.0 3rd 1.0 to 1.0 O.D. .7 to 1.0 Rev. 4.53 to 1.0	165	Special For Customer	None
** T87E (Truck)	Cane or Remote	3 Synchro.	1st 3.714 to 1.0 2nd 1.871 to 1.0 3rd 1.0 to 1.0 Rev. 4.588 to 1.0	220	S.A.E. #3 S.A.E. #4 S.A.E. #5	None
** T87F (Truck)	Remote	3 Synchro.	1st 3.217 to 1.0 2nd 1.871 to 1.0 3rd 1.0 to 1.0 Rev. None	220	S.A.E. #3 S.A.E. #4 S.A.E. #5	None
**T98A (Truck)	Cane or Remote	4 Synchro.	1st 6.398 to 1.0 2nd 3.092 to 1.0 3rd 1.686 to 1.0 4th 1.0 to 1.0 Rev. 7.820 to 1.0	220	S.A.E. #3 S.A.E. #4	1 Right or Left S.A.E. Regular Duty Type Opening
**T98A-L2 (Truck)	Same as T98A except also full reversing					1 Right S.A.E. Regular Duty Type Opening

<u>Model</u>	<u>Control</u>	<u>Speeds</u>	<u>Ratios</u>	<u>Torque Capacity in Lbs. Ft.</u>	<u>Clutch Housing Mountings</u>	<u>Power Take-Off Mountings</u>
T86E (Pass.Car)	Remote	3 Synchro.	1st 2.571 to 1.0 2nd 1.550 to 1.0 3rd 1.0 to 1.0 Rev. 3.489 to 1.0	220	Special For Customer	None
T86E-R10B (Pass.Car)	Remote	3 Synchro. and Overdrive	1st 2.571 to 1.0 2nd 1.550 to 1.0 3rd 1.0 to 1.0 O.D. .7 to 1.0 Rev. 3.489 to 1.0	220	Special For Customer	None
T89A (Light Truck)	Remote	3 Synchro.	1st 2.518 to 1.0 2nd 1.631 to 1.0 3rd 1.0 to 1.0 Rev. 2.991 to 1	220	Special For Customer	None
T89B (Light Truck)	Remote	3 Synchro.	1st 3.167 to 1.0 2nd 1.753 to 1.0 3rd 1.0 to 1.0 Rev. 3.761 to 1.0	220	Special For Customer	None
T85C (Pass.Car)	Remote	3 Synchro.	1st 2.49 to 1.0 2nd 1.587 to 1.0 3rd 1.0 to 1.0 Rev. 3.154 to 1.0	300	Special For Customer	None
T85C-R11 (Pass.Car)	Remote	3 Synchro. and Overdrive	1st 2.49 to 1.0 2nd 1.587 to 1.0 3rd 1.0 to 1.0 O.D. .7 to 1.0 Rev. 3.154 to 1.0	300	Special For Customer	None
Model #5 (Truck or Pass.Car)	Auto. 2-3 Detent 1-2-3	3	1st 2.4 to 1.0 2nd 1.467 to 1.0 3rd 1.0 to 1.0 Rev. 2.0 to 1.0	250	Converter Hsg. Mounting Special for Customer	None
Model #5 (Truck or Pass.Car)	Auto. 1-2-3	3	1st 2.4 to 1.0 2nd 1.467 to 1.0 3rd 1.0 to 1.0 Rev. 2.0 to 1.0	250	Converter Hsg. Mounting Special for Customer	None

<u>Model</u>	<u>Control</u>	<u>Speeds</u>	<u>Ratios</u>	<u>Torque Capacity in Lbs.Ft.</u>	<u>Clutch Housings Mountings</u>	<u>Power Take-Off Mountings</u>
Model #5 (To take transfer box for 4-Wheel Drive)	Auto. 2-3 or 1-2-3	3	1st 2.4 to 1.0 2nd 1.467 to 1.0 3rd 1.0 to 1.0 Rev. 2.0 to 1.0	250	Converter Hsg. Mounting Special for Customer	Special Through Transfer Box
R10-F R10-G R10-H	Speed Throttle	2	Conven. 1.0 to 1.0 O.D. .7 to 1.0	230	----	None
72N	Special	1 forward 1 reverse	1.0 to 1.0 forward and reverse		Converter housing mounting S.A.E. #3 & #4	None
72P	Cane or Remote	3 full reverse	Same as T87E	220	Converter housing mounting S.A.E. #3 & #4	None
72Q	Cane or Remote	4 full reverse	Same as T98A	220	Converter housing mounting S.A.E. #3 & #4	None

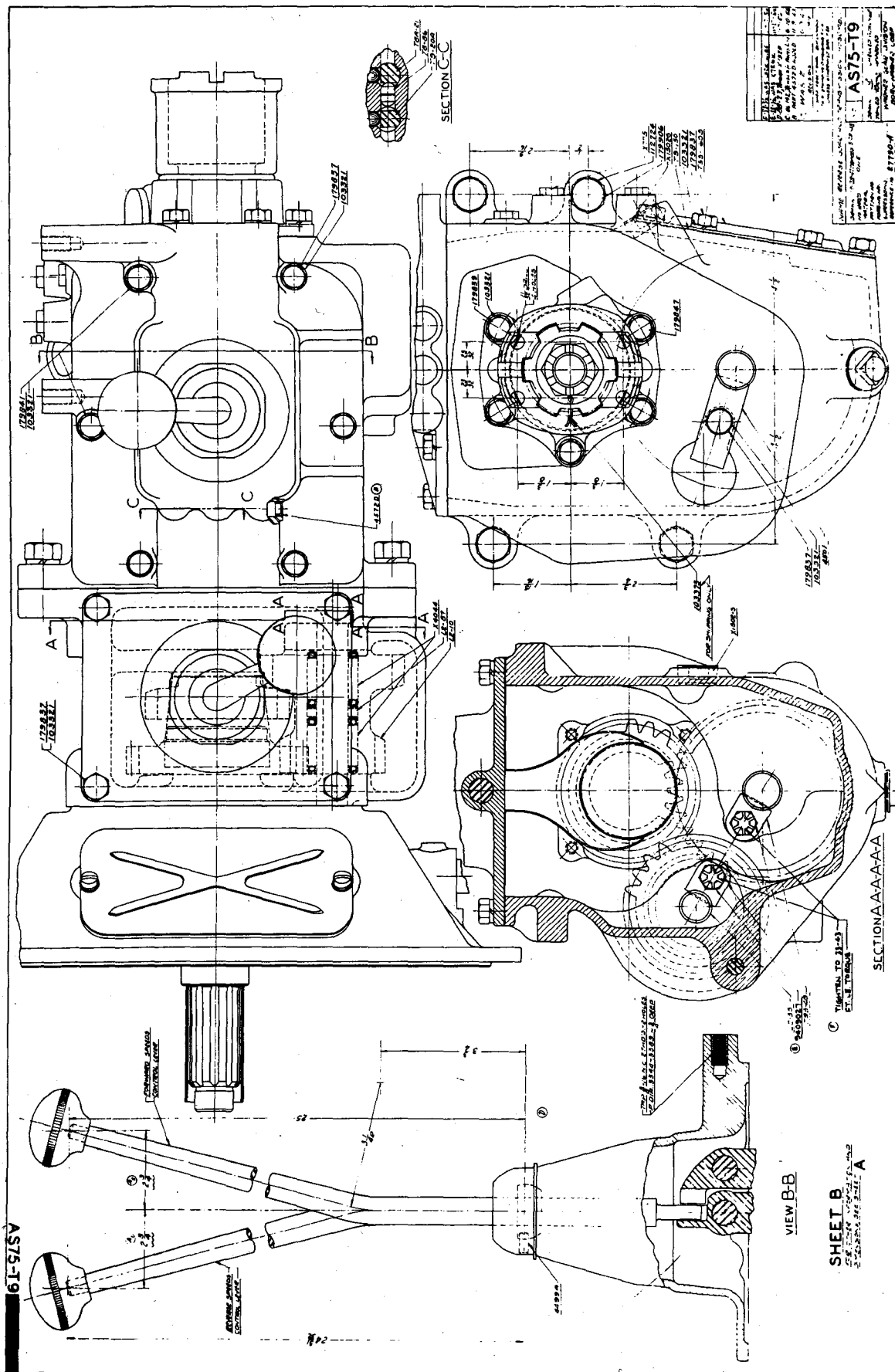
**In general front end fittings to apply to the following engines:

Hercules White	Continental Nash	Waukesha Wisconsin	Ford Buda	Studebaker International Harvester
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INDUSTRIAL TRANSMISSIONS

<u>Model</u>	<u>Control</u>	<u>Speeds</u>	<u>Ratios</u>	<u>Converter Housing Mounting</u>	<u>Drop Center Line Input Shaft to Center Line Output Shaft</u>	<u>Brake</u>	<u>Gearing</u>	<u>Dry Weight</u>
T12	Power Shift Forward & Reverse	1	High 1.19 to 1.00	S.A.E. #3 & #4	4.250 in.	No	8 Pitch Spur	224 lbs.
T11	Forward & Reverse Power Shift High & Low Manual	2	High 1.19 to 1.00 Low 2.41 to 1.00	S.A.E. #3 & #4	4.250 in.	No	8 Pitch Spur	261 lbs.
T22	Forward & Reverse Power Shift High & Low Power Shift	2	High 1.1 to 1.00 Low 1.38 to 1.00	S.A.E. #3 & #4	9.143 in.	Yes	8 Pitch Spur	356 lbs.
T22A	Forward & Reverse Power Shift High & Low Power Shift	2	High .713 to 1.00 Low 2.29 to 1.00	S.A.E. #3 & #4	9.143 in.	Yes	8 Pitch Spur	361 lbs.

Although the above transmission models have been rated as to capacity, the rating is only a very general index as to the type of application for which the model was intended. Other operational factors of the vehicle influence the capacity requisite of the transmission in addition to engine torque. Therefore we do not recommend or warrant any model transmission unless we have full knowledge of all the details of a specific application and give our approval.



NO. AS75-T9 REVERSE GEAR AND TRANSMISSION ASSEMBLY

VARIOUS BENDS AND LENGTHS ON CONTROL
LEVER ARE AVAILABLE FOR THIS UNIT
ALSO AVAILABLE IS CONTROL LEVER HAND
BALL C37J-50A

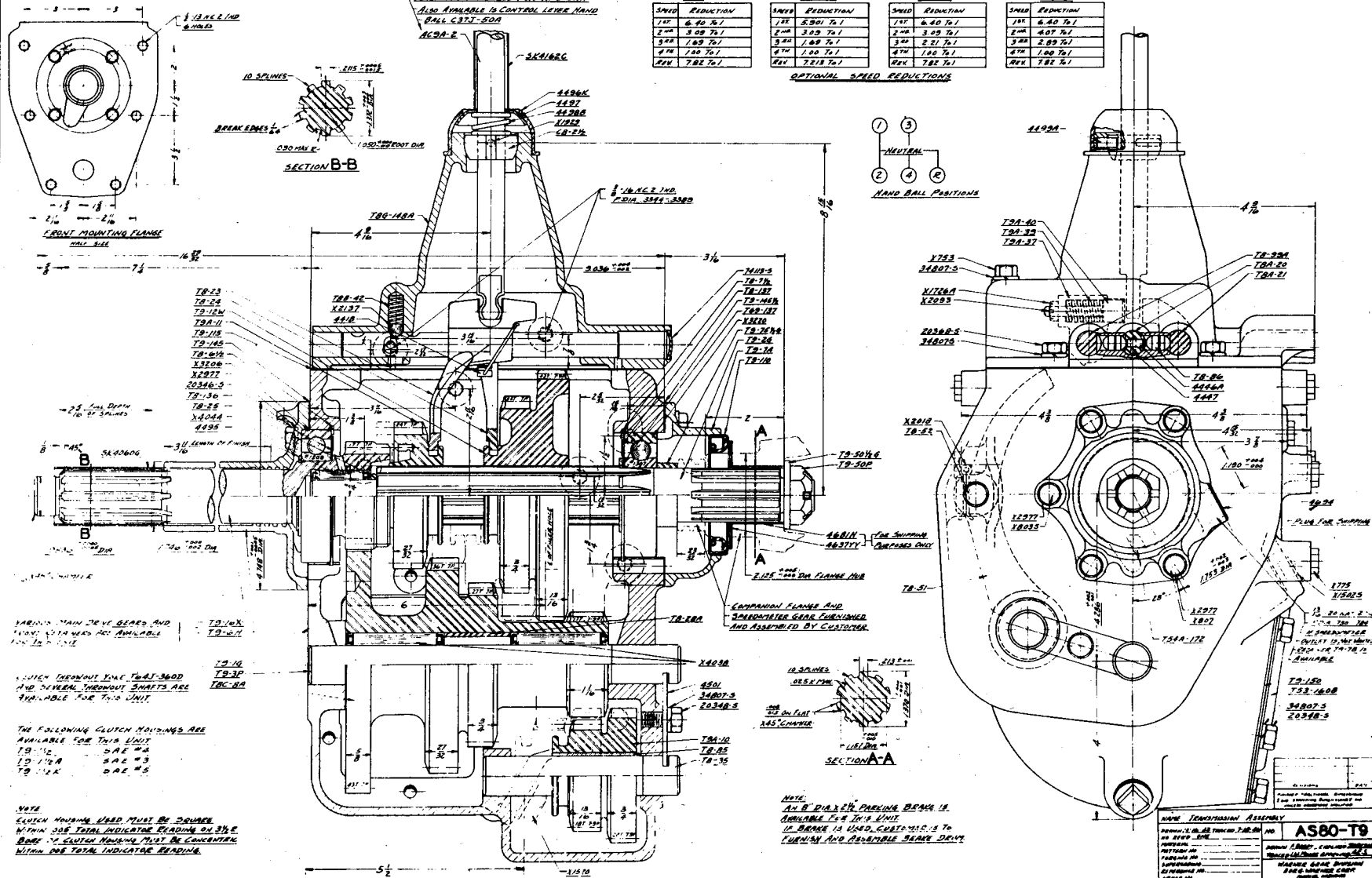
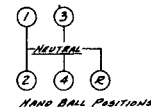
SPEED	REDUCTION
100	6.40 To 1
200	3.09 To 1
300	1.69 To 1
400	1.00 To 1
500	7.82 To 1

SPEED	REDUCTION
1ST	5.501 To 1
2ND	3.09 To 1
3RD	1.69 To 1
4TH	1.00 To 1
RED	7.213 To 1

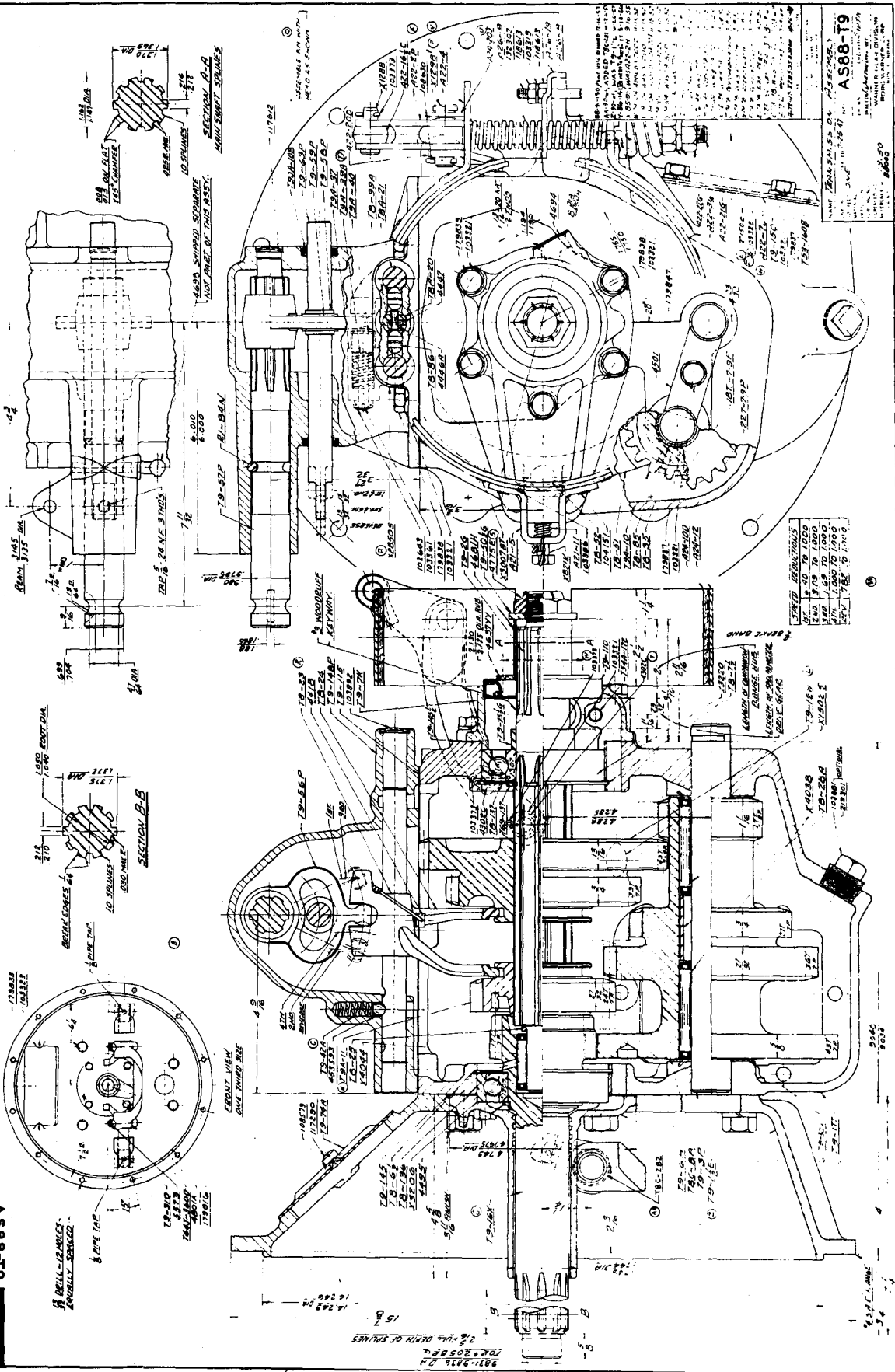
T9B	
SPEED	REDUCTION
1ST	6.40 To 1
2ND	3.09 To 1
3RD	2.21 To 1
4TH	1.00 To 1
REV.	7.82 To 1

T9C	
SPEED	REDUCTION
1ST	6.40 To 1
2ND	4.07 To 1
3RD	2.69 To 1
4TH	1.00 To 1
REV.	7.82 To 1

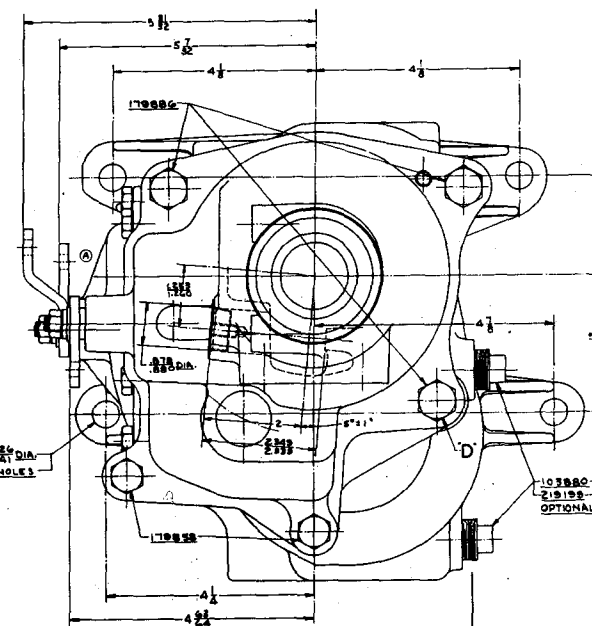
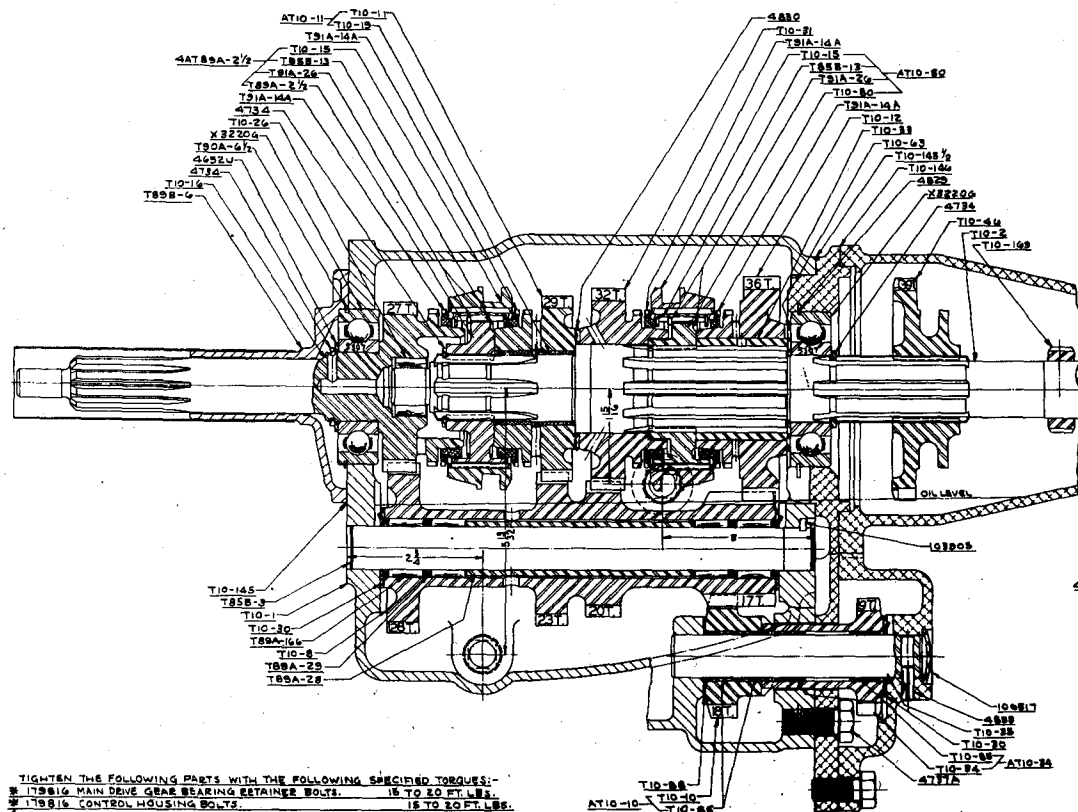
OPTIONAL SPEED REDUCTIONS



AS88-T9



NO. AS88-T9 TRANSMISSION ASSEMBLY



SHEET A OF
SHEETS A&B

TIGHTEN THE FOLLOWING PARTS WITH THE FOLLOWING SPECIFIED TORQUES:-
 179816 MAIN DRIVE GEAR BEARING RETAINER BOLTS 15 TO 20 FT. LBS.
 179818 CONTROL HOUSING BOLTS 15 TO 20 FT. LBS.
 179820 EXTENSION HOUSING TO CASE BOLTS 35 TO 45 FT. LBS.
 179822 EXTENSION HOUSING TO EXTENSION ADAPTER BOLTS 20 TO 30 FT. LBS.
 179824 EXTENSION ADAPTER TO CASE BOLT 20 TO 30 FT. LBS.
 103880 OR 219193 TRANS. DRAIN PLUG 15 TO 25 FT. LBS.
 103880 OR 219193 TRANS. FILLER PLUG AT TRANSMISSION PLANT 10 TO 15 FT. LBS.
 AT ASSEMBLY PLANT AFTER CHECKING LUBRICATION LEVEL 25 TO 35 FT. LBS.

TORQUE ON RECHECK AFTER 24 HOURS TO BE 50% MIN. OF INDICATED TORQUE FOR BOLTS MARKED **C** & 10% MIN. OF INDICATED TORQUE FOR BOLTS MARKED **D**.

179819 - SPECIAL SEALING CEMENT USED AT THE FOLLOWING LOCATIONS:-
 4895 - OILER SHIRT LOCK PIN
 179819 - CONTROL HOUSING BOLT THREAD MARKED **C**
 179816 - MAIN DRIVE GEAR BEARING RETAINER BOLTS THREADS
 179820 - EXTENSION HOUSING TO CASE BOLT THREAD MARKED **D**

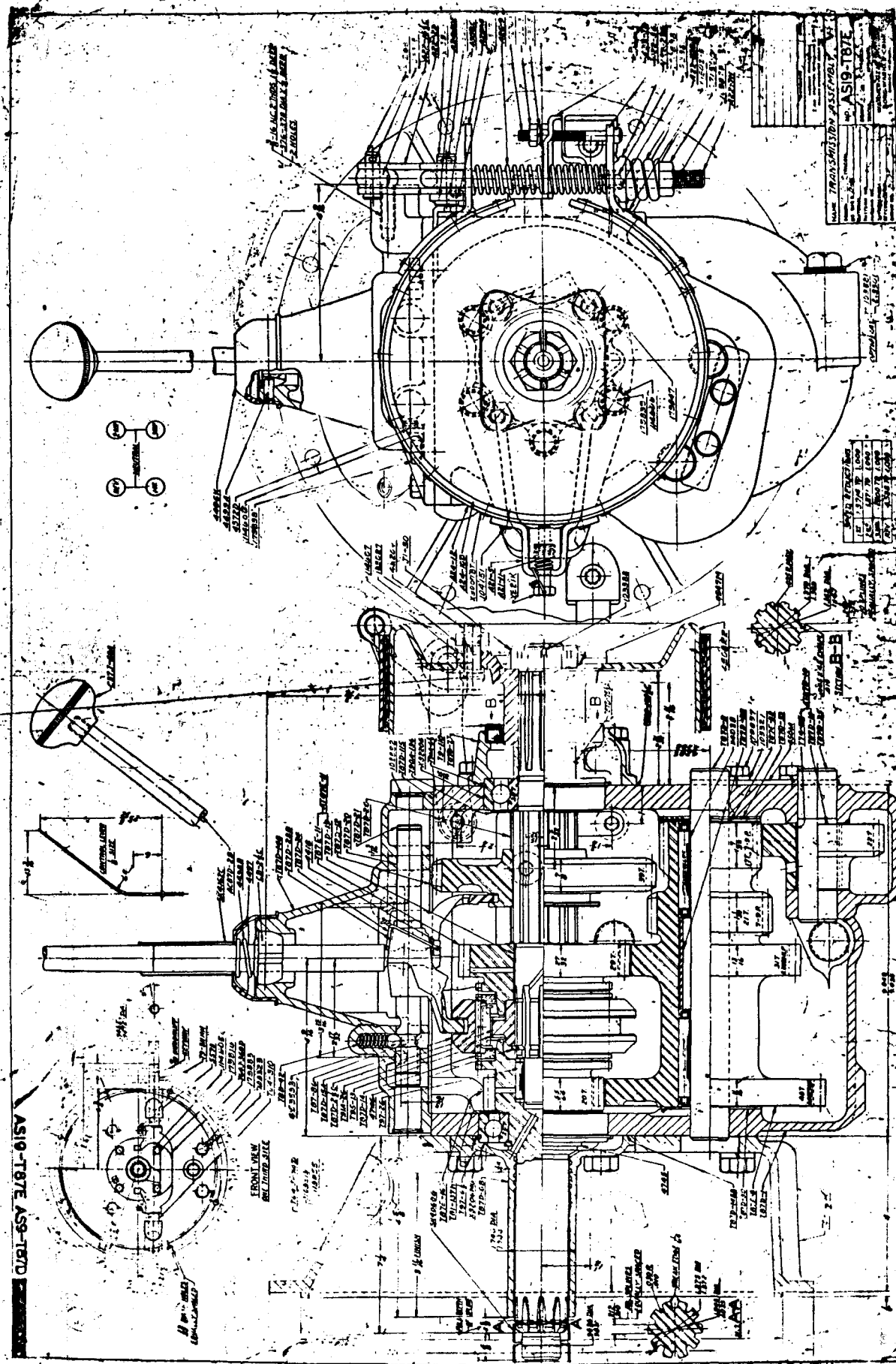
0.75 DIA. MPF'S IDENTIFICATION MUST APPEAR ON THIS PART. OMISSION REQUIRES THE APPROVAL OF CHEVROLET MOTOR DIVISION.

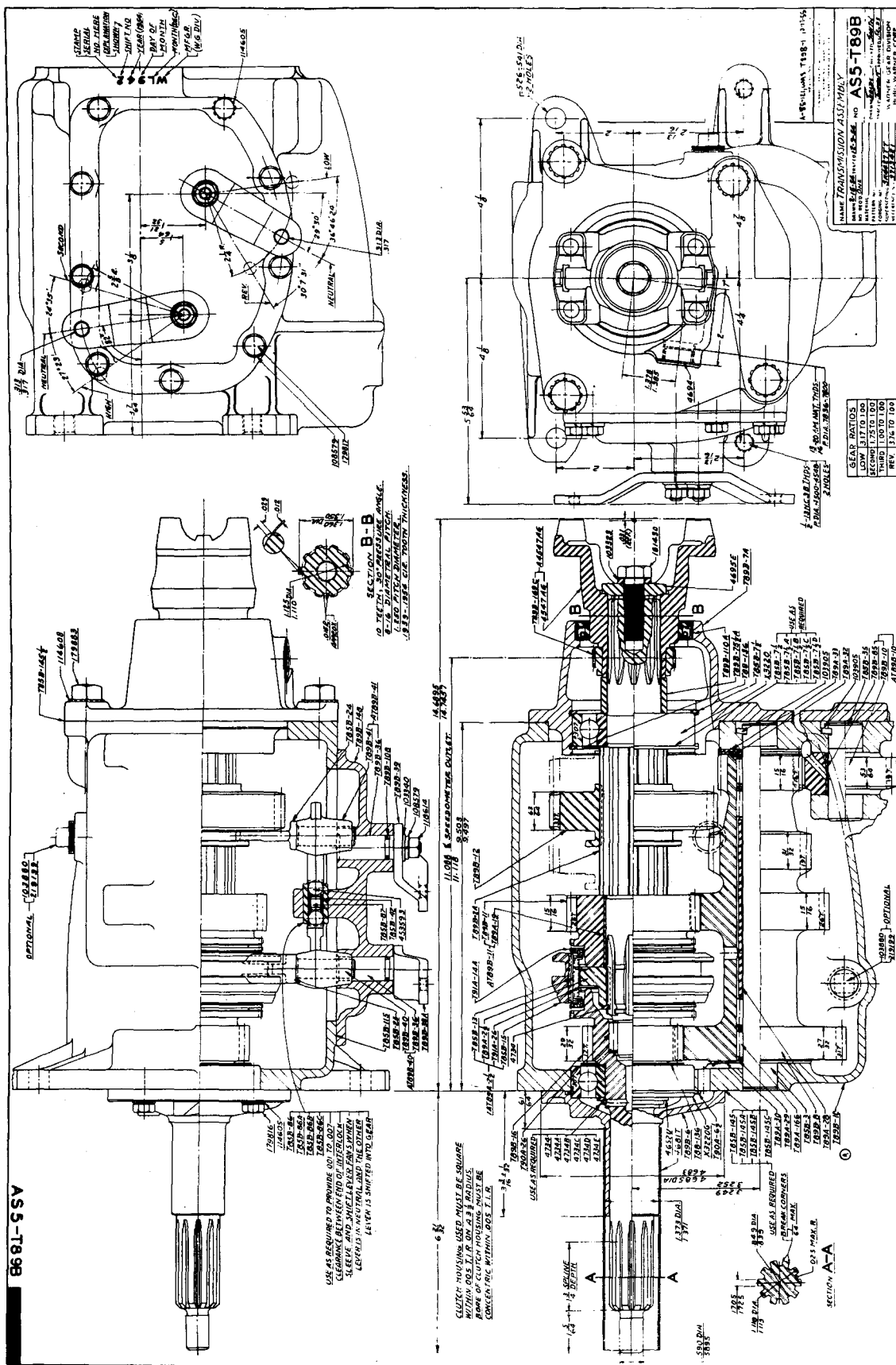
LUBRICATE AT TIME OF ASSEMBLY AS FOLLOWS:-
 SUPERBLA 22 OIL - TO OBTAIN BOLTER BEARINGS
 EQUIVALENT AS REQUIRED.
 MACHINING OIL M-16 - SPRAY OIL SEAL FELT WIPER, 10LSE GEARS
 (S.M. 484848M) BUSHING, THIRD SPEED GEAR BUSHING,
 SECOND SPEED GEAR BUSHING, FIRST SPEED
 GEAR BUSHING, 10' KING SEALS.
 SPRAY INTERIOR WITH FINE MIST AFTER
 ASSEMBLY & PRIOR TO TEST.

GEAR RATIO	TO	FROM
TOW	2	20
SECOND	1.68	10
THIRD	1.31	10
FOURTH	1.00	10
REVERSE	2.28	10

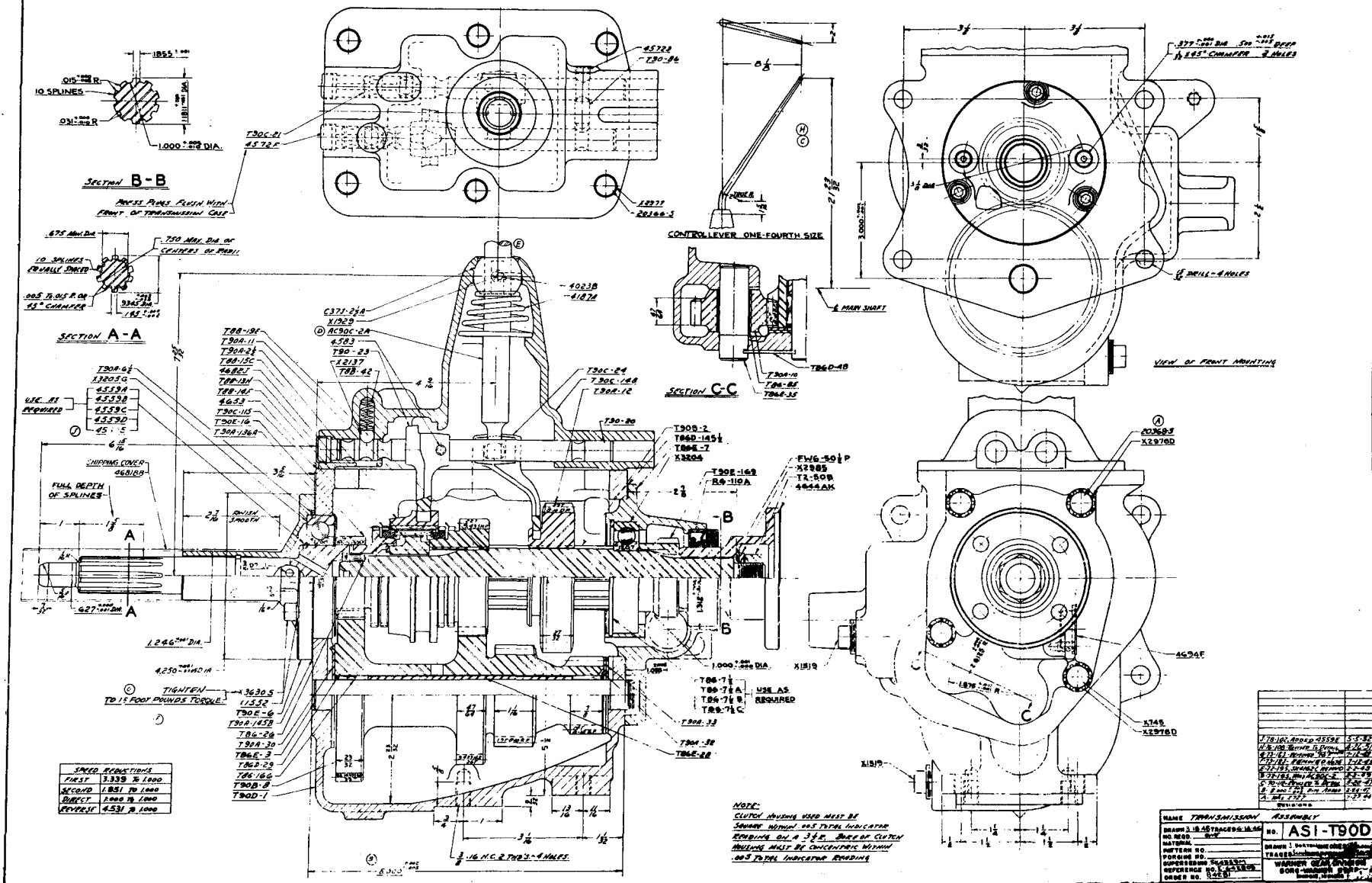
NAME TRANSMISSION ASSEMBLY	
DATE	1-19-58
NO.	AS5-T10
DRAWN BY: CHECKED BY: [Signature]	
PATTERN NO. [Blank]	
FURNISHED BY: [Blank]	
SUPERSEDES: [Blank]	
REFERENCE NO. 179817	
ORDER NO. 88541	
WARNER GEAR DIVISION BOND-WARNER CORP. WARREN, OHIO	

(1953 Pat. (L.A.) 2484



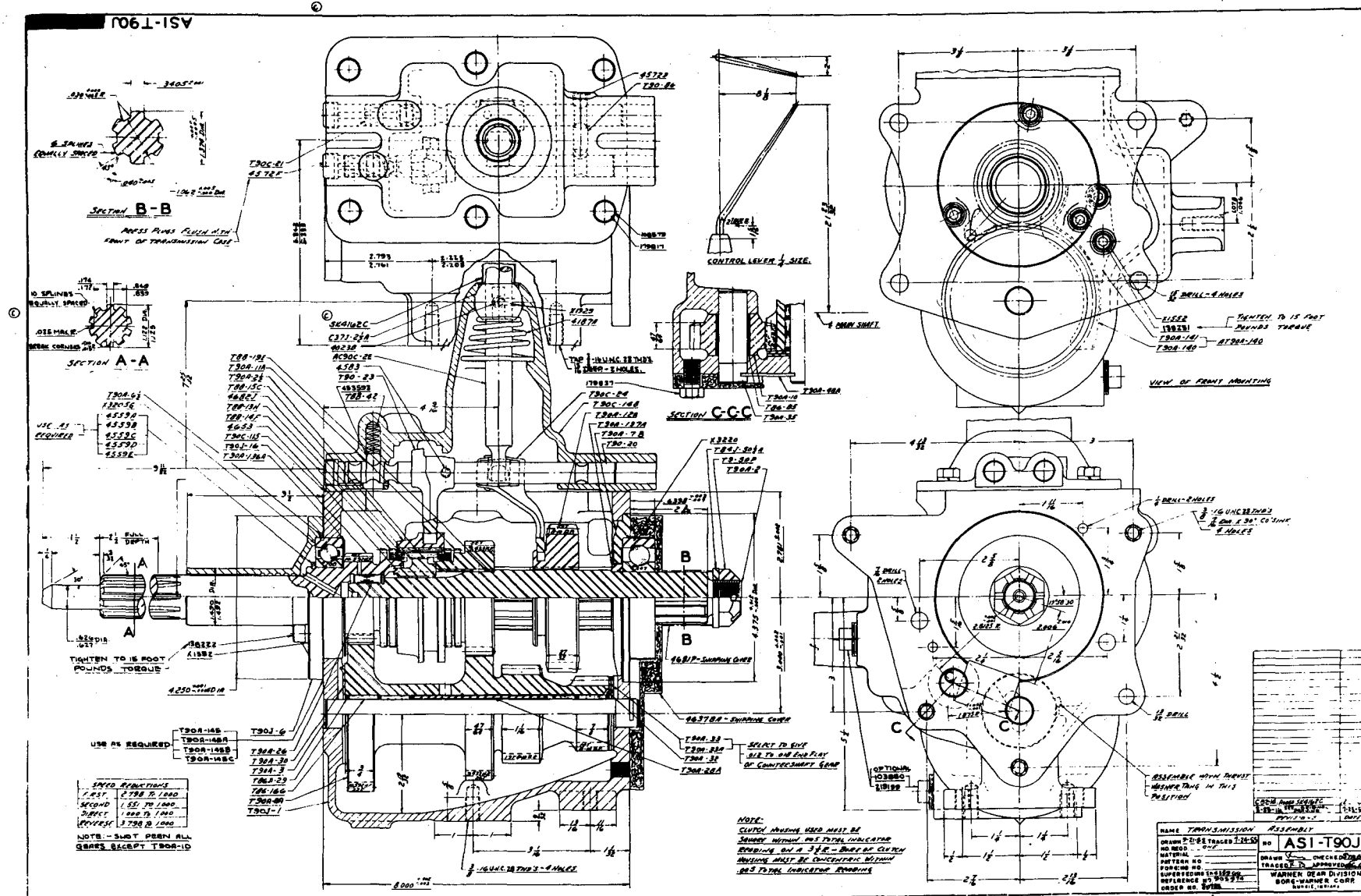


0061-T90D

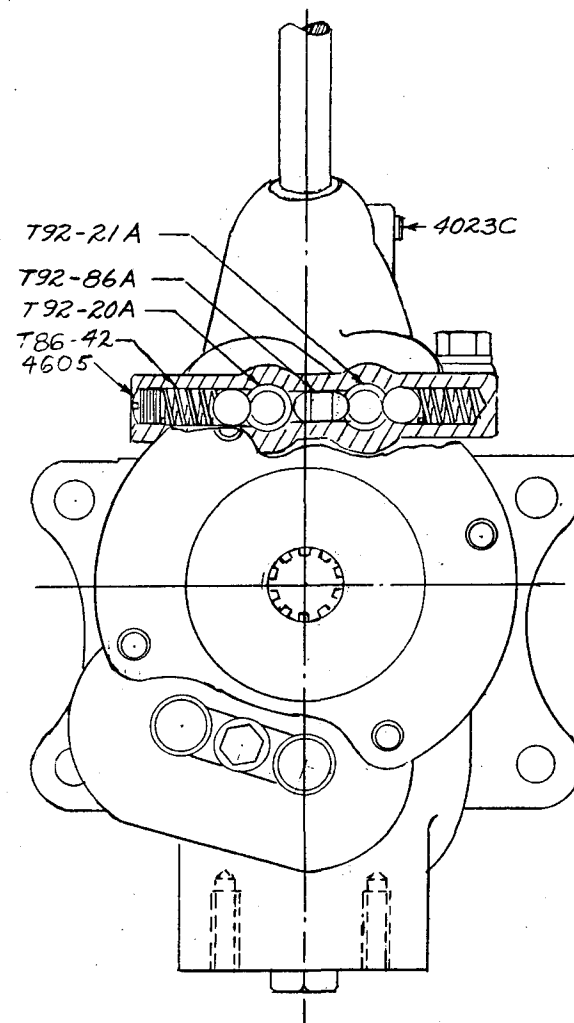
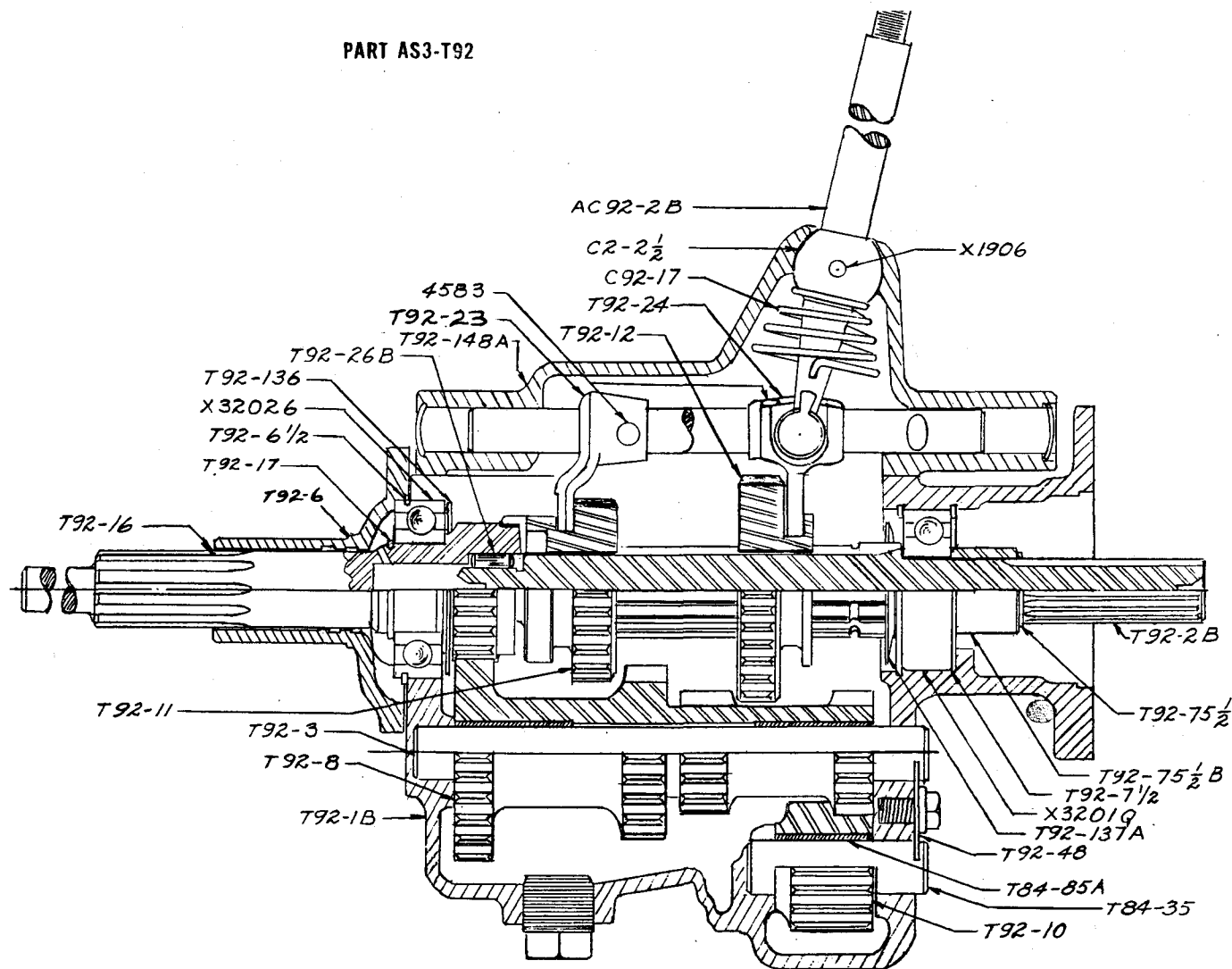


NO. ASI-T90D TRANSMISSION ASSEMBLY

NO. ASI-T90J TRANSMISSION ASSEMBLY



PART AS3-T92

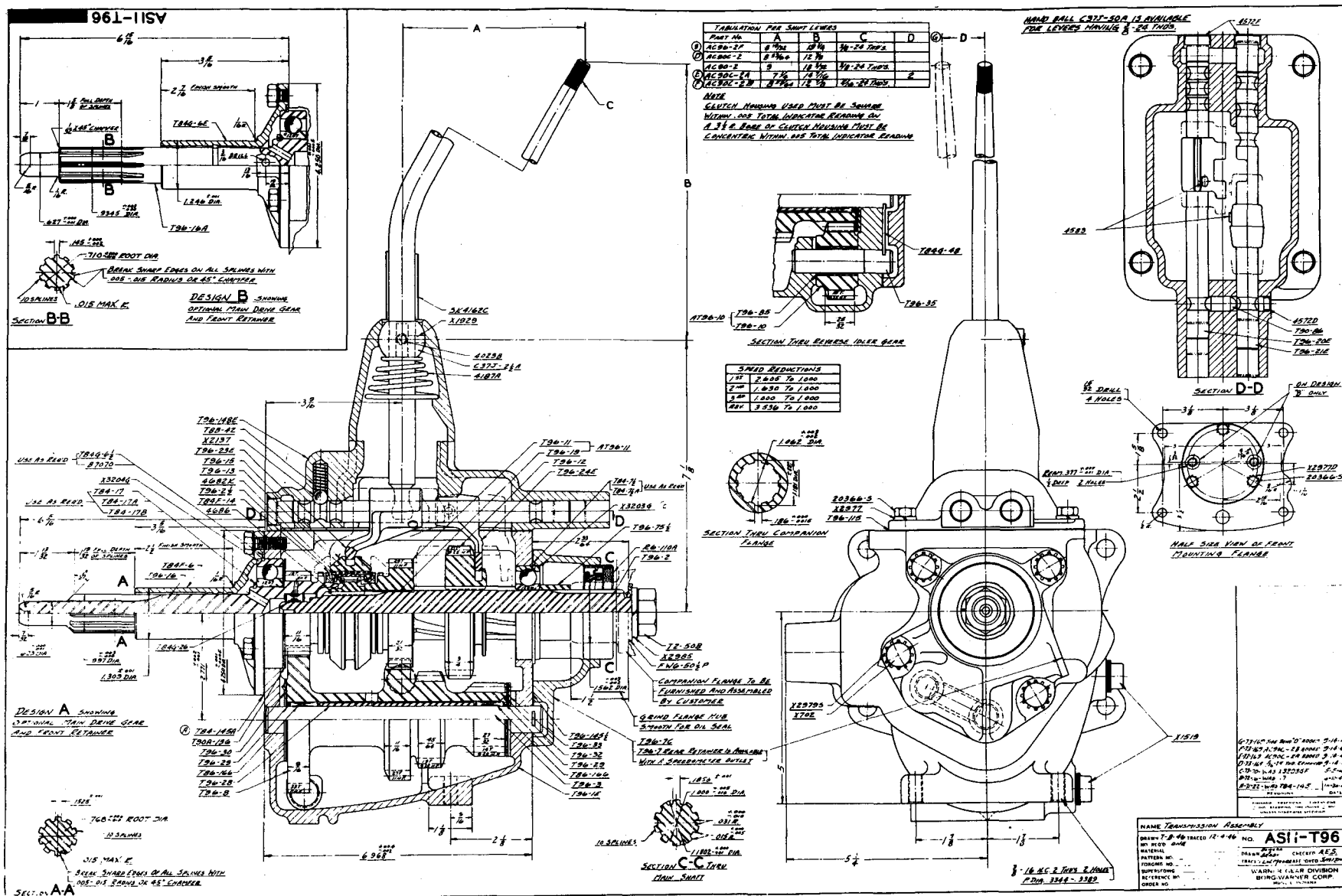


WARNER GEAR DIVISION

BORG-WARNER CORPORATION

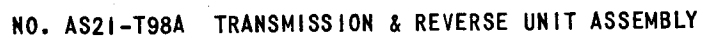
1106 E. SEYMOUR ST.

MUNCIE, INDIANA

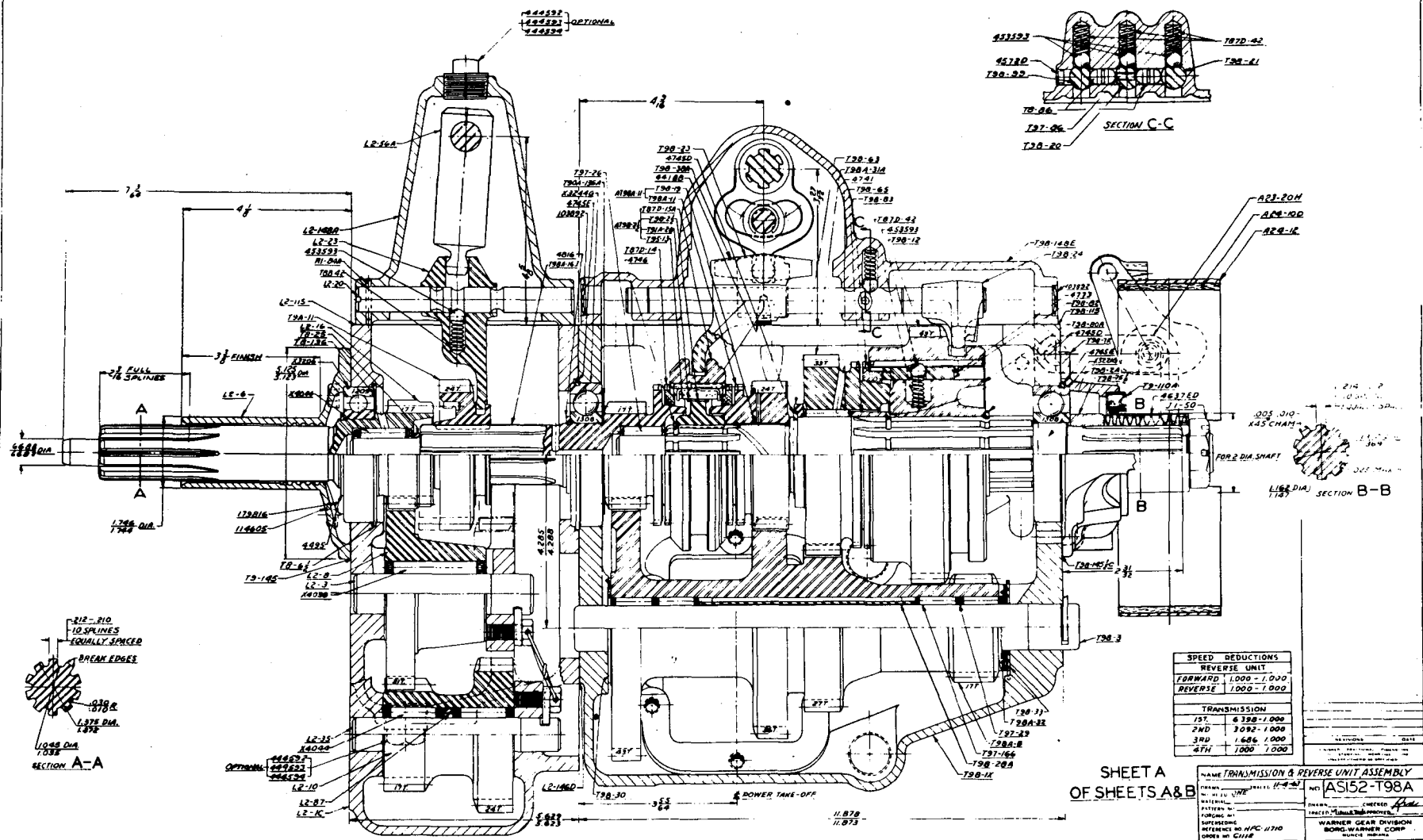


NO. ASI I-T96 TRANSMISSION ASSEMBLY

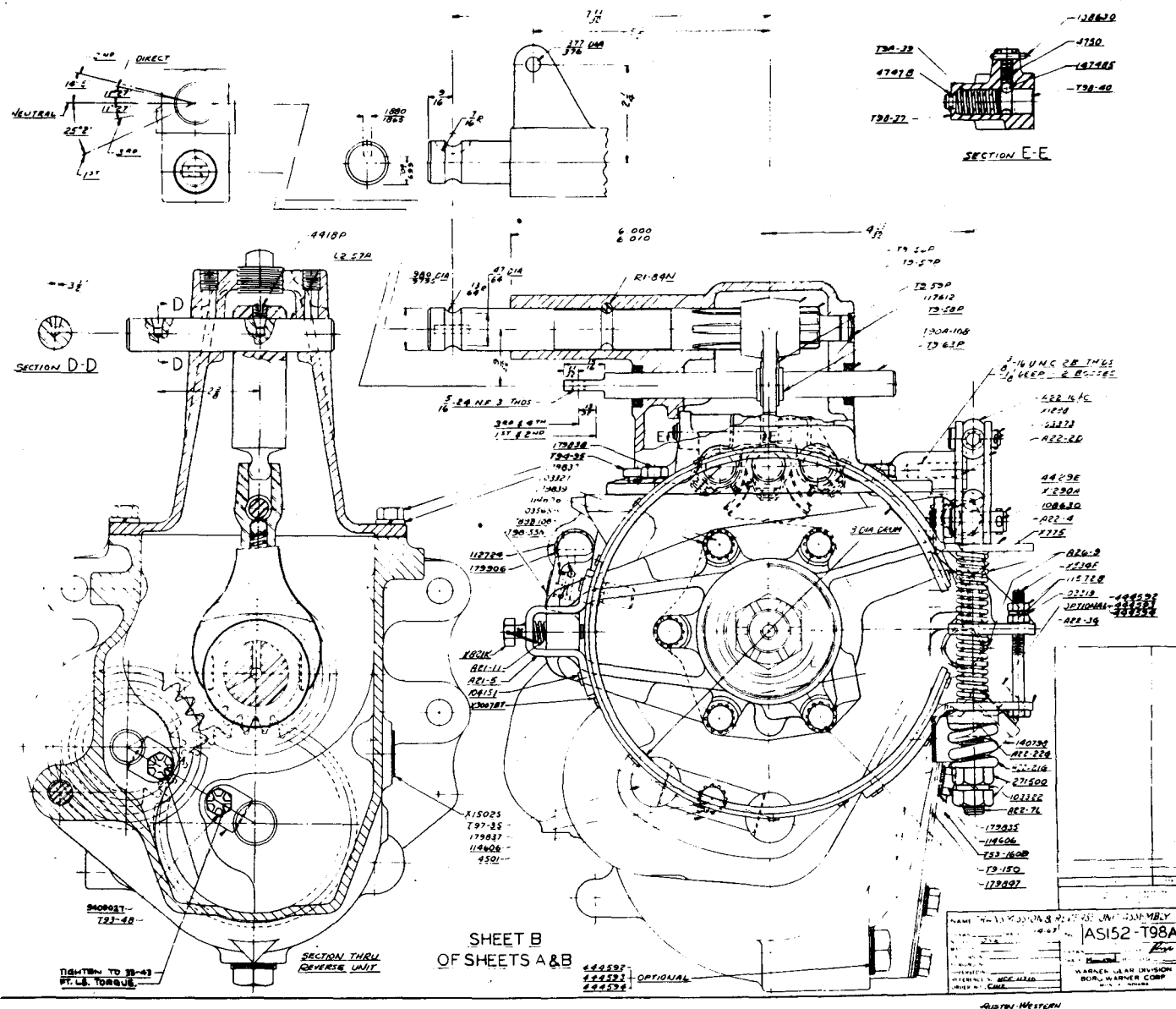




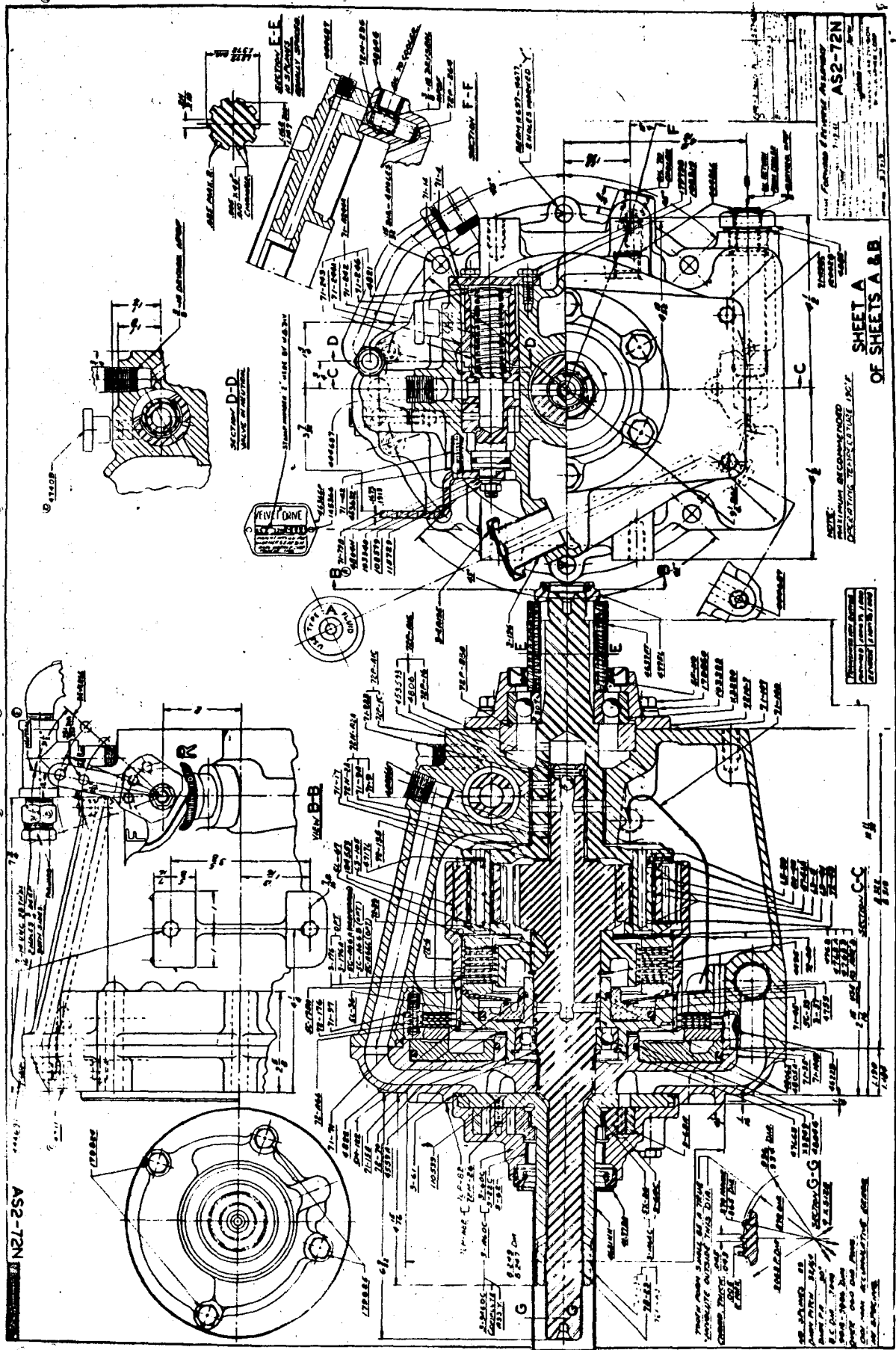
AS152-198A



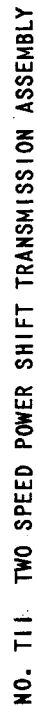
NO. AS152-T98A TRANSMISSION & REVERSE UNIT ASSEMBLY







NO. AS2-72N FORWARD & REVERSE ASSEMBLY



TII-14-
109920 (8 REG
179819 (8 REG
198221 (4 REG
109920 (4 REG
128202 _____
109919 _____

3-63A
 TII-64
 (H) 4888
 ATII-3 - [TII-2
 TII-1
 SPLINE

6AT11-60
(COMPLETE)

SPLINE
4806C
T11-62
T11-22
T11-60
4804J
4804K

AT11-16 — 4840E
 — T11-16
 — 4806F
 4 — [AT11-66 — T11-84
 — 104248
 — T11-85
 — T11-86

EXTERNAL INVOLUTE SPLINE "Y" DATA	
FLAT ROOT - SIDE FIT	
NO. OF TEETH	19
DIAMETRAL PITCH	12-24
PRESSURE ANGLE	30°
PITCH DIAMETER	1.5833
MAJOR DIAMETER	1.650 - 1.646
MINOR DIAMETER	1.495 - 1.500
BASE CIRCLE DIAMETER	1.3712
T.I.E. DIAMETER (MAX)	1.513
CIRCULAR TOOTH THICKNESS	1.086 - 1.054

GEAR RATIOS:	
FORWARD	1.19 : 1
REVERSE	1.19 : 1

4806D (2 REQ'D)
4823 (2 REQ'D)
TII-50 -
4622C -
TII-67 -
ATII-67

III-70
III-145 -
III-111 (2 req'd)
X3204 -
III-111 -

TII-191 —
103519 (2 REQD) —
179791 (2 REQD) —
TII-37 —
103520 (3 REQD) —
179816 (3 REQD) —
(R) 4/15/84

4806D (2 REQ'D)
4823 (2 REQ'D)
TII-50 -
4622C -
TII-67 -
ATII-67

4806E (2REQ'D)
T11-111 (2REQ'D)
T11-6 } AT11-6
4840F
T11-12 }

179827 (4 REQ'D)
179820 (8 REQ'D)
103320 (12 REQ'D)
T-11-210

T11-12
4824
T86-G¹₂
X3204G
4734B
T11-116

— AT11-116

T12-149
179817 (4 REQ'D.)
103320 (4 REQ'D.)
T12-150
X3251
T11-110 } AT12-7
T12-7 }

4864T

T12-2 AT12-2

SPLINE 'Z'
99817 (6 REQ'D.)
4622 (6 REQ'D.)

INTERNAL INVOLUTE SPLINE		Z DATA
FLAT ROOT - SIDE FIT		
NO. OF TEETH		
DIAMETRAL PITCH		
PRESSURE ANGLE		
PITCH DIAMETER		
MAJOR DIAMETER		1.868 - 1
MINOR DIAMETER		1.125 - 1
BASE CIRCLE DIAMETER		
T.P. DIAMETER (MIN)		

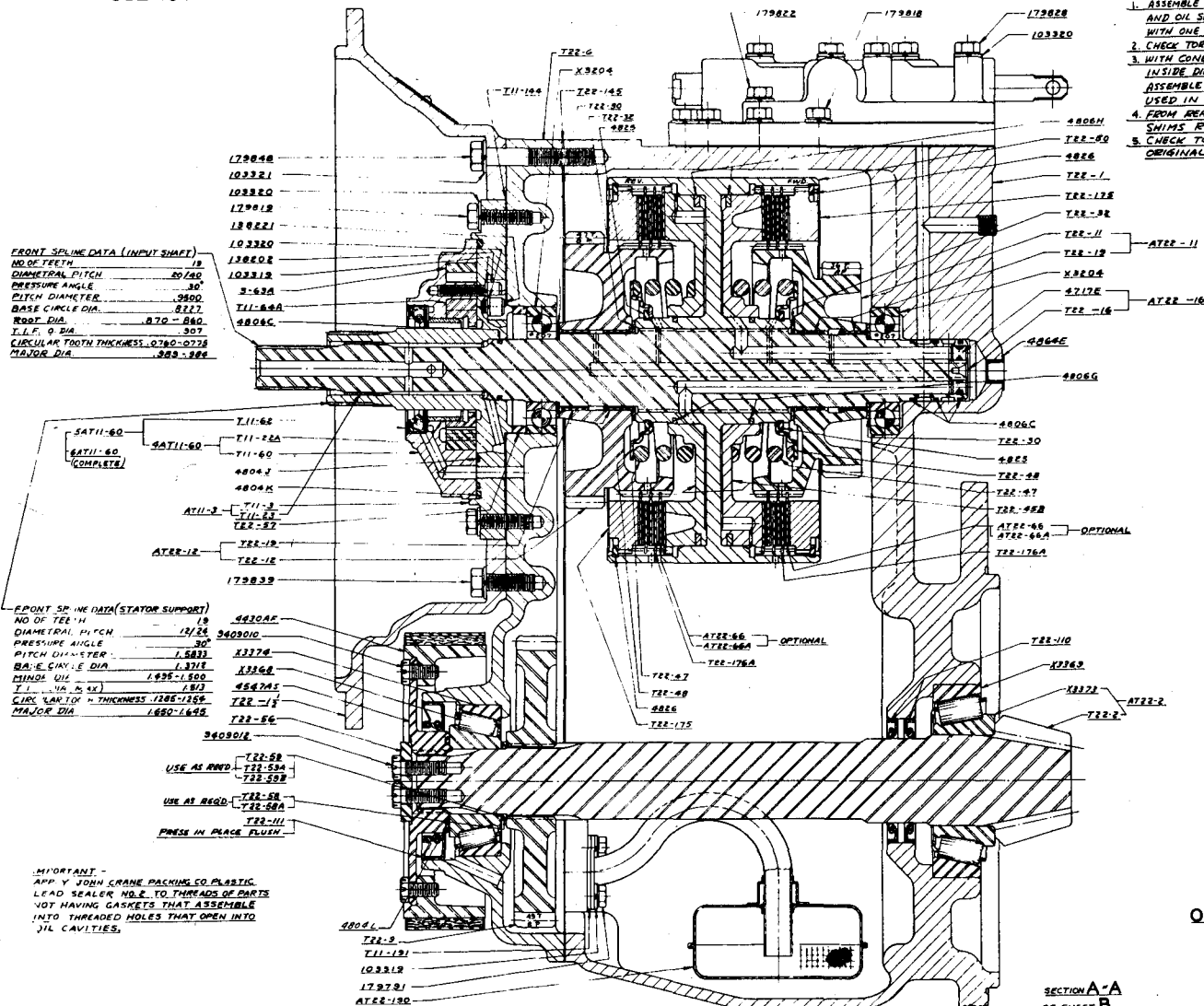
SHEET A
OF SHEETS A, B, C & D

FOR TORQUE CHART FOR
BOLTS & NUTS SEE T11-400

FOR PROCEDURE OF FINAL
TEST SEE T12-402.

NAME TRANSMISSION ASSEMBLY		UNLESS OTHERWISE SPECIFIED
DRAWING NO. 68-57	TRACES 68-57-52	NO. ASI-T12
NO. RECD. ONE	MATERIAL	DRAWN BY W. H. HICKS
PATTERN NO.	FORGING NO.	TRACED BY W. H. HICKS
SUPERSEDES	REFERENCE NO. 4751335	WARNER GEAR DIVISION
ORDER NO. 83152		BORG-WARNER CORP.

ASI-T22



1. ASSEMBLE TRANSMISSION LESS CONVERTER HOUSING, BRAKE BAND AND OIL SEAL. SUBSTITUTE BEARING CONE & ROLLER ASSEMBLY WITH ONE HAVING CLEARANCE ON OUTPUT SHAFT.
2. CHECK TORQUE LOAD.
3. WITH CONE & ROLLER ASSEMBLY REMOVED, GAGE TO SPACER FROM INSIDE DIAMETER OF CUP.
4. ASSEMBLE OTHER GAGE OVER CONE & ROLLER ASSEMBLY TO BE USED IN FINAL ASSEMBLY & GAGE TO FACE OF INNER RACE.
5. FROM READINGS TAKEN DETERMINE NUMBER & THICKNESS OF SHIMS REQUIRED & MAKE FINAL ASSEMBLY.
6. CHECK TORQUE LOAD - TO BE 5 TO 15 IN. LB. GREATER THAN ORIGINAL READING IN ITEM # 2.

	GEAR RATIOS	
	HIGH	LOW
FORWARD	1.1	1.88
REVERSE	1.1	1.88

FOR TORQUE CHART FOR
 BOLTS & NUTS SEE T11-488.

SHEET A
OF SHEETS A, B, C, D & E

NAME: TRANSMISSION ASSEMBLY	
DATE: 11-27-57	NO. 11-27-57
BY: RWD	NO. 11-27-57
CHECKED: RWD	NO. 11-27-57
DESIGNED: RWD	NO. 11-27-57
PATTERN: RWD	NO. 11-27-57
TYPING: RWD	NO. 11-27-57
SUPPLEMENT: RWD	NO. 11-27-57
REFERENCE: RWD	NO. 11-27-57
ORDER NO. 11-27-57	NO. 11-27-57

Bec

NO. T22 TWO SPEED POWER SHIFT TRANSMISSION ASSEMBLY

