Product Update Bulletin

Allison Transmissions

INCREASED OIL TEMPERATURE LIMITS

OFF HIGHWAY APPLICATIONS

PUB. NO. 2

DATE MARCH 1978

FORM 8514

DETROIT DIESEL ALLISON DIVISION
GENERAL MOTORS CORPORATION
P. O. BOX 894
INDIANAPOLIS, INDIANA 46206
ATTENTION: SALES DEVELOPMENT H-4

Detroit Diesel Allison
Division of General Motors Corporation

Indianapolis Operations

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SUBJECT: Increased Oil Temperature Limits - Off-Highway Applications

REFERENCE: PIM 361

Improvements in transmission component materials and oil technology will now permit increases in the maximum allowed operating oil temperatures. These new limits apply to all transmission models used in off-highway applications.

Experience has shown that for most off-highway applications the cooling requirements should be based on continuous cooling at the 70% efficiency point. Where specific operating conditions are known that require continuous cooling at less than 70% efficiency, the known conditions should be used in the design of the cooling system. At the relevant operating efficiency the previous 121.1°C (250°F) maximum converter out temperature is being increased to 135°C (275°F). This limit applies to continuous operation. During typical duty cycles, the actual converter out temperature may rise above the 135°C (275°F) point but should never be allowed to exceed the absolute maximum of 165°C (330°F). For the purpose of sizing the transmission cooler and engine radiator an ambient temperature of 43.3°C (110°F) should be assumed unless more specific operating conditions are known.

During retarder operation the maximum temperature has been increased from 148.9°C (300°F) to 165°C (330°F). Thus, intermittent retarder operation is allowed that produces temperatures up to 165°C (330°F). When this limit is reached, operation must be discontinued until the oil temperature is reduced. For the design of the retarder cooling system, 43.3°C (110°F) ambient should be used unless specific operating conditions are known.

The temperature gauges, P/N's 6838457, 6838458 and 6838459 are being changed accordingly. The new gauge will show a green band between 40°C (104°F) and 135°C (275°F), yellow band between 135°C (275°F) and 165°C (330°F) and red beyond 165°C (330°F). The new gauge will include both Metric and English units.

A decal, P/N 6880750 shown on the attached, is also available. This decal provides additional explanation of the various operating bands and is available from service parts.

Allison Transmissions

Sales Brief

Date 5-28-76 No. 9, Rev. J

Temperature and Pressure Gauges

I. INTRODUCTION

A satisfactory transmission installation includes adequate instrumentation to enable the operator to monitor transmission operation at all times. Dependable temperature and pressure gauges, properly installed and conveniently located can alert the operator to any abnormal condition inside the transmission.

The Detroit Diesel Allison Division of General Motors recommends the use of a suitable temperature warning system on all installations of Torqmatic Converters, Powershift Transmissions, and Fully Automatic Transmissions. In addition, a main oil pressure gauge is recommended for all Powershift Transmission installations.

Temperature and pressure gauges are not included as a part of an Allison Torqmatic Converter, Powershift or Fully Automatic Transmission. However, temperature and pressure gauges suitable for use with these products, are available from Allison, as well as from a variety of gauge manufacturers.

Allison gauges may be purchased from the Transmission Parts Department, Detroit Diesel Allison Division, General Motors Corporation, P.O. Box 894, Indianapolis, Indiana. If ordered on the same purchase order with transmissions and/or Torque Converters, the gauges should be shown separately and identified both by Allison part number and description.

Gauges presently available from Allison are listed on the following pages. Prices and availability will be quoted upon request.

II. TEMPERATURE GAUGES

Listed below are the Capillary tpye temperature gauges available for use with Allison Torqmatic Converters and Powershift Transmissions. These gauges provide a green safe operating band from 100°-250°F. (38°-121°C.) and a red over-heat band from 250°-320°F. (121°-160°C.). The gauge face is white and the Detroit Diesel Allison Logo appears on the gauge face. These gauges have a full 200° sweep for improved readability. These gauges may be illuminated by either an internal or external source. Refer to AS 00-045 Drawing for dimensional information.

Allison Part No.	Capillary Length
6838457	10.5-11.0 Feet (3.20-3.35 Meters)
6838458	6.0- 6.5 Feet (1.83-1.98 Meters)
6838459	4.0- 4.5 Feet (1.22-1.37 Meters)

A. Automatic Transmissions

The automatic transmissions have a separate Temperature Gauge Kit (6880751). The gauge face provides a temperature range from 100°F.-300°F. (40°-150°C.). The guage has a Detroit Diesel Allison logo that comes separate. The face of the gauge is green for temperatures between 100°-250°F. (40°-130°C.) and yellow for temperatures of 250°-300°F. (130°-150°C.). The gauge can be illuminated by an internal or external source.

Allison Part No.	Name
6880751	Kit
8992253	Temperature Gauge
8992016	Temperature Sending Assy.
5655149	Wiring Harness
131282	Bulb #53
6880752	Instruction Sheet
9428754	Self-Locking Nut
6880750	Decal

These parts are sold as a Kit (6880751) only.

III. PRESSURE GAUGES

Listed below are the pressure gauges presently available from Allison for use with Torqmatic Converters and Powershift Transmissions.

Transmission Model	Allison Gauge P/N	Color Band	Range Calibration PSI	Range Calibration kPa
TG 600	6838450	Red (low)	0-140	0-966
CRT 3531, 3630		Green	140-185	966-1276
		Red (high)	185-250	1276-1724

PRESSURE GAUGES (cont.)

Transmission Model	Allison Gauge P/N	Color Band	Range Calibration PSI	Range Calibration kPa
CT-CLT 3000	6838453	Red	0-90	0-620
		White	90-135	620-932
		Green	135-260	932-1793
		Red	260-300	1793-2069
CLBT 5/6000 TT, TRT 4000	6838454	Red	0-160	0-1103
		Green	160-220	1103-1517
		Red	2200-300	1517-2069
CRT 5000 CRT 3331*, 3321	6838451	Red	0-110	0-758
		Green	110-150	758-1033
		Red	150-200	1033-1378

*CRT 3331 pressure schedule is actually 145-155 PSI (932-1034 kPa). Allison P/N 6838451 represents a best fit with available gauges.

CLBT 4000	6838452	Red	0-100	0-690
		White	100-175	690-1207
		Green	175-280	1207-1931
		Red	280-300	1931-2069
DP 8000	6838455	Red	0-140	0-966
		Green	140-250	966-1724
		Red	250-300	1724-2069
TT-TRT 2000	6838456	Red	0-130	0-897
		Green	130-195	897-1345
		Red	195-250	1345-1724

The face of the gauges listed above reflect the new Detroit Diesel Allison trademark on the gauge face. These gauges may be illuminated by an external light source. Refer to AS 00-045 Drawing for dimensional information required for installation.

Allison Transmissions

Sales Brief

Date 5-28-76 No. 28, Rev. J

OIL FILTER MODELS

1. This Sales Brief provides a listing of filter models which are applicable with the various Allison Torqmatic Drive Installation.

2. The following list of commercially available transmission oil filters was compiled as a service to manufacturers, owners and operators of equipment using Allison Torqmatic Drives. It is based on information received from the respective suppliers of these filters.

   Also listed are the pertinent hydraulic circuit drawings which outline general filter specifications and show recommended line size and fittings.

   Responsibility of the quality of these filters and their performance in service must remain with the filter manufacturer. This list should, therefore, not be construed as a recommendation of the products contained therein by the Allison Division of the General Motors Corporation.

3. Industrial Torque Converters

   A. TC-200-300 Series Torque Converters

      AS 31-006 External Hydraulic Circuit Requirements

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	Type PMD-13 P/N 5574784	Type PF-132W P/N 5573014

      Note: For severe applications, or operation in contaminated environment, the remote heat exchanger configuration, with a full-flow filter in the cooler circuit, is recommended. These filters are customer furnished.

   B. TC-400-500 Series Torque Converters

      AS 51-004 External Hydraulic Circuit Requirements (Converter only)

      AS 51-005 External Hydraulic Circuit Requirements with Transmission

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	Type PMD-13 P/N 5574784	Type PF-132W P/N 5573014

Note: The filters to be used with this series converters are customer furnished.

C. TC-800-900 Series Torque Converters

AS 81-003 External Hydraulic Circuit Requirements (TCHD 800 and 900)

AS 81-009 External Hydraulic Circuit Requirements

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	Type PMD-13 P/N 5574784	Type PF-132W P/N 5573014

Note: The filters to be used with this series converters are customer furnished.

4. TG-600 Series Transmission

AS 06-002 External Hydraulic Circuit Requirements (TG-TCB)

AS 06-015 External Hydraulic Circuit Requirements (TG with two TC)

a. Filters to be used with transmissions only.

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	PMD-13 5574784	PF-132W 5573014
Cuno Engineering Corp. 4511 Brookpark Road Cleveland 29, Ohio	Catalog #12838 4.15 x .0015-5	
Wm. W. Nugent & Co., Inc. 3440 Cleveland Street Skokie, Illinois	1116-PY-IS	

b. Filters to be used with transmission plus a torque converter.

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	PMD-13 5574784	PF-132W 5573014
Air Maze Corp. 25000 Miles Road Cleveland, Ohio	Q9T189	

Company	Filter Model	Replaceable Element (cont.)
Bendix Skinner Division Bendix Aviation Corp. Royal Oak, Michigan	R Type	
Briggs Filtration Co. River Road Washington 16, D.C.	Z-1-AR-SV8 P/N Exp. 328	
Filter Supply Co. 9709 Atlantic Avenue South Gate, Cal.	50-T2-VJ6	
Michiana Products Corp. Michigan City, Indiana	17050	
Wm. W. Nugent & Co., Inc. 3440 Cleveland Street Skokie, Illinois	1116-PY-IS	
Permanent Filter Corp. 1800 West Washington Blvd. Los Angeles, California	215DF	
Rol-Pact Company 532 South Marengo Avenue Alhambra, California	RV-20	

The filters listed above for installation of a transmission plus a converter can be used for an installation of a transmission only or a converter only. For an installation of a converter only, the full capacity is required; however, for a transmission only, one-half capacity is required.

Note: The filters to be used with this series transmission are customer furnished.

5. Hauling Transmissions

A. CT and CLT-3000 Series

AS 34-006 External Hydraulic Circuit Requirements

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	Type PM-13-5 P/N 5575208	Type PF-132W P/N 5573014

Company	Filter Model	Replaceable Element (cont.)
Air Maze Corp. 25000 Miles Road Cleveland, Ohio	Q9RA165XD	
Cuno Engineering Corp. 4511 Brookpark Road Cleveland 29, Ohio	Catalog #12838 4.15 x .0015-5	
Fram Corporation Dexter, Michigan	FH33-PLOE	
Wm. W. Nugent & Co., Inc. 3440 Cleveland Street Skokie, Illinois	1116-PY-IS or 1576-IS	

Note: The filters to be used with this series transmission are customer furnished.

B. CLBT-4000 Series

AS 44-004 External Hydraulic Circuit Requirements

AS 00-004 Single Filter Installation Data

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	PM-13-5 P/N 5575208	Type PF-132W P/N 5573014

Note: The filters to be used with this series transmission are customer furnished.

C. CL(B)T 5000 and 6000 Series

AS 58-002 Remote Hydraulic Circuit
(CT-CLT 5640 and 5840, all models)

AS 58-003 Remote Hydraulic Circuit
(CBT-CLBT 5640 and 5840, all models)

AS 58-004 Filter Installation Drawing

AS 58-029 Installation Drawing

AS 58-040 External Hydraulic Circuit (CT and CLT)

AS 58-041 External Hydraulic Circuit
(CBT and CLBT)

1. Transmissions with Integral Filters

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	PMD-22 P/N 5576103	Type PF-151 P/N 5576200

Note: The integral filters are supplied by Allison and the replaceable element can be ordered by the customer.

2. Transmissions with Remote Mounted Filters

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	PMD-22 P/N 5576103	Type PF-151 P/N 5576200

Note: The filters, when remote mounted, are customer furnished.

D. DP-8000 Series

AS 58-004 Filter Installation Drawing

AS 80-008 External Hydraulic Circuit

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	Type PMD-22 P/N 5576103	Type PF-151 P/N 5576200

Note: These filters are Allison furnished when mounted on the transmission and are customer furnished when remote mounted.

6. Cycling Transmissions

A. TT, TRT-1-2-4000 Series

AS 22-004 External Hydraulic Circuit Requirements (TT and TRT-1-2000 Series)

AS 42-003 External Hydraulic Circuit Reauirements (TT and TRT 4000 Series)

Company	Filter Model	Replaceable Element
Air Maze Corp. 25000 Miles Road Cleveland, Ohio	Type SKD P/N SKD-2055	
Delux Products	P/N 326429	
Fram Corporation Dexter, Michigan	Type F-1632	
Schroeder	Type LF-1 P/N LF-1-IK-25P	

Note: The twin turbine series transmissions have provisions for remote mounted filters only. These filters are customer furnished.

B. CRT-3000 Series

AS 33-001 External Hydraulic Circuit Requirements (3331-1 and 3 and 3531-1)

Transmissions with Remote Mounted Filters

Company	Filter Model	Replaceable Element
AC Division GMC Flint 2, Michigan	Type PM-13-2 P/N 5574867	PF-132W P/N 5573014
Air Maze Corp. 25000 Miles Road Cleveland, Ohio	Q9RA165XD	
Cuno Engineering Corp. 4511 Brookpark Road Cleveland 29, Ohio	Catalog #12838 4.15 x .0015-5	
Fram Corporation Dexter, Michigan	FH33-PLOE	
Wm. W. Nugent & Co., Inc. 3440 Cleveland Street Skokie, Illinois	1116-PY-IS or 1576-IS	

Note: CRT-3000 Series Transmissions have provisions for remote mounted filters only. These filters are customer furnished.

C. CRT 5000 Series

AS 56-004 External Hydraulic Circuit

AS 58-004 Filter Installation Drawing

1. Transmissions with Integral Filters

Company	Filter Model	Replaceable Element
AC Division GMC Flint, Michigan	None	Type PF-132 P/N 5573014

2. Transmissions with Remote Mounted Filters

Same filters as applicable to the TG 600 Series Transmissions plus converter installations.

NOTE: The initial filter element for the integral mounted series is Allison furnished, whereas the remote mounted filters are customer furnished.

7. Automatic Transmissions

A. AT, MT Series

AS 36-003 External Hydraulic Circuit
AS 20-009 External Hydraulic Circuit

Company	Filter Model	Replacement Element
AC Division GMC Flint, Michigan	PM-13-7 P/N 5576446	PF-132W 5573014
	PM16-1 5575246	PF-141 P/N 5574540

B. AT 540

The FRAM HP-1 spin-on filter, mounted to the FRAM HPK-2 filter base can be used on the AT 540 ONLY.

NOTE: The initial filter element for this series is Allison furnished whereas the replacement elements are customer furnished.

C. HT 70 Series

AS 40-003 External Hydraulic Circuit Requirements
AS 00-004 Single Filter Installation Data

C. HT 70 Series cont.

Company	Filter Model	Replacement Element
AC Division GMC Flint, Michigan	Type PM-13-5 P/N 5575208	Type PF 132 P/N 5573014

NOTE: The filters for this series transmission are remote mounted and are customer furnished.

D. HT 700 Series

AS 00-004 Single Filter Installation Data
AS 41-009 External Circuit Requirements
AS 41-029 Provision for External Filter

Company	Filter Model	Replaceable Element
AC Division GMC Flint, Michigan	Type PM-13-2 P/N 5575208	Type PF-132 P/N 5573014

NOTE: The filters for this series transmission are remote mounted and are customer furnished.

Allison Transmissions

Sales Brief

Date 7/22/68 No. 40 Rev. B

IMPLEMENT PUMPS FOR ALLISON FULL REVERSING TRANSMISSIONS

Hydraulic implement pump(s) driven by the transmission engine driven PTO is a necessity on most full reversing transmission applications. Therefore, as a convenience to aid in selecting a satisfactory pump, hydraulic pump manufacturers were contacted and asked to supply a listing of their products available for the following transmissions:

Transmission	Pad Size	AS Drawing Ref	PTO Use
TT, TRT-2000	SAE "A" - 2 Bolt	22-011 & -022	Steer
TT, TRT-2000	SAE "C" - 4 Bolt	22-011 & -022	Implement
TT, TRT-2000 (opt.)	SAE "C" - 2 Bolt	22-011 & -022	Implement
TT, TRT-2000 (opt.)	SAE "B" - 2 Bolt	22-011 & -022	Implement
CRT-3000	SAE "C" - 4 Bolt	33-009	Implement
CRT-3000	SAE "A" - 2 Bolt	33-008	Steer
TT, TRT-4000	SAE "C" - 4 Bolt	42-004	Implement
TT, TRT-4000 (opt.)	SAE "C" - 2 Bolt	42-004	Implement
TT, TRT-4000 (opt.)	SAE "B" - 2 Bolt	42-004	Implement
TT, TRT-4000	SAE "C" - 2 or 4 Bolt	42-004	Steer
CRT-5000	SAE "C" - 4 Bolt	56-007	Implement (or Steer)

The following pump manufacturers submitted a listing of their pump models:

Dennison Division, Abex Corporation, Columbus, Ohio
Werner Motive Division, Borg Warner Corporation, Auburn, Indiana
Cessna Aircraft Company, Hutchinson, Kansas
Commercial Shearing and Stamping Company, Youngstown, Ohio
Hydreco Division, Signal Oil Corporation, Cleveland, Ohio
Tyrone Hydraulics, Incorporated, Corinth, Mississippi
Vickers, Incorporated, Detroit, Michigan

These listings do not constitute an application approval by Allison or the pump manufacturer and no assurance is implied regarding the physical installation ability of the pump onto a specific transmission.

Numerous combinations of single and double pumps from various manufacturers could be used on the dual PTO's of the twin turbine transmissions. Questions concerning the use of dual and tandem pumps should be referred to the pump manufacturer.

Sales Brief No. 40 Rev. B

Date: 7/22/68

Certain pump models have vented flanges or can be provided with a vented flange as an option. The use of this type pump is recommended by Allison to prevent implement pump oil from entering into the transmission oil system. The attached listing has been marked to show those models available with vented flanges.

Information regarding pump prices, availability, physical size and installation details such as lines and fitting requirements should be obtained from the pump manufacturer. The Allison Division does not distribute or sell this equipment or participate in the sale in any way.

For further information regarding transmission PTO rating, capacity or application use, contact Transmission Sales, Department #7341, P. O. Box 894, Indianapolis, Indiana 46206.

ABEX CORP.
DENISON VANE PUMPS
for
TT & TRT - 1000 - 2000 - 4000 SERIES

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI)
DOUBLE PUMPS - "C" SIZE MTG. 2-BOLT [TT-TRT-4000]						
T4DC-028-008	28 & 8	2200	2500	59.	104.	10.
T4DC-028-011	28 & 11	2200	2500	64.	112.	11.
T4DC-028-014	28 & 14	2200	2500	69.	121.	11.
T4DC-028-017	28 & 17	2200	2500	75.	131.	12.
T4DC-028-022	28 & 22	2200	2500	83.	145.	12.
T4DC-031-008	31 & 8	2200	2500	64.	113.	11.
T4DC-031-011	31 & 11	2200	2500	69.	121.	11.
T4DC-031-014	31 & 14	2200	2500	74.	130.	12.
T4DC-031-017	31 & 17	2200	2500	80.	140.	12.
T4DC-031-022	31 & 22	2200	2500	88.	154.	13.
T4DC-035-008	35 & 8	2100	2500	69.	120.	11.
T4DC-035-011	35 & 11	2100	2500	74.	128.	12.
T4DC-035-014	35 & 14	2100	2500	79.	137.	12.
T4DC-035-017	35 & 17	2100	2500	84.	145.	13.
T4DC-035-022	35 & 22	2100	2500	92.	159.	14.
T4DC-038-008	38 & 8	2000	2500	70.	121.	11.
T4DC-038-111	38 & 11	2000	2500	75.	130.	12.
T4DC-038-014	38 & 14	2000	2500	80.	138.	12.
T4DC-038-017	38 & 17	2000	2500	85.	146.	13.
T4DC-038-022	38 & 22	2000	2500	98.	158.	14.
T4DC-045-008	45 & 8	1900	2500	76.	132.	12.
T4DC-045-011	45 & 11	1900	2500	81.	139.	12.
T4DC-045-014	45 & 14	1900	2500	86.	148.	13.
T4DC-045-017	45 & 17	1900	2500	91.	156.	14.
T4DC-045-022	45 & 22	1900	2500	97.	167.	15.
STEER PUMP - S.A.E. "A" SIZE MTG. [TT-TRT-1-2000]						
TMB-001	1.7	1800	2000	1.5	3.4	.7
TMB-002	2.5	1800	2000	2.7	5.	.7
TMB-004	4.2	1800	2000	4.8	8.	.7
TMB-005	5.3	1800	2000	7.	9.7	.7
TMB-006	6.0	1800	2000	7.5	11.2	.7
IMPLEMENT PUMP S.A.E. "C" SIZE MTG. 2-BOLT [TT-TRT-1-2-4000]						
T4D-020	20	2400	2500	36.	63.	6.
T4D-028	28	2200	2500	47.	81.	6.
T4D-031	31	2200	2500	52.	90.	7.
T4D-035	35	2200	2500	62.	100.	10.
T4D-038	38	2100	2500	63.	104.	10.
T4D-045	45	2000	2500	70.	118.	13.

*Rev. 6/25/68

BORG WARNER CORP.

WARNER-MOTIVE HYDRAULIC PUMPS

VENTED PUMP FLANGE CAN BE PROVIDED AS OPTION ON ALL MODELS LISTED.

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI)
A.E. "A" SIZE MOUNTING FLANGE						
P2-2	.9	4000	2000	3.35	5.0	.96 HP
P2-3	1.6	4000	2000	5.8	8.0	1.03 HP
P2-4	2.0	4000	2000	7.25	9.5	1.05 HP
P2-5	2.6	4000	2000	9.4	12.3	1.05 HP
P2-6	3.0	4000	2000	11.2	14.5	1.05 HP
P2-7	3.9	4000	2000	13.9	18.0	1.05 HP
P2-8	4.1	4000	2000	15.2	19.5	1.05 HP
P2-9	4.6	3500	2000	14.3	18.5	1.06 HP
P2-10	6.0	3000	2000	14.5	19.0	1.06 HP
.A.E. "B" SIZE 2-BOLT MOUNTING FLANGE						
P3-9	4.5	3000	2000	12.0	17.0	2.4 HP
P3-12	6.3	3000	2000	16.7	23.0	2.45 HP
P3-15	8.3	3000	2000	21.8	29.5	2.50 HP
P3-19	10.5	3000	2000	27.0	35.0	2.60 HP
P3-23	13.0	3000	2000	34.0	44.0	2.60 HP
P3-28	15.5	3000	2000	39.5	55.0	2.65 HP
P3-32	17.5	3000	2000	45.0	66.0	2.70 HP
.A.E. "C" SIZE MOUNTING FLANGE						
P4-28	14.0	2500	2000	31.2	68.0	2.90 HP
P4-35	18.0	2500	2000	40.0	57.0	2.90 HP
P4-46	24.0	2500	2000	52.0	70.0	2.95 HP
P4-55	30.0	2500	2000	65.0	87.0	3.00 HP
P4-64	35.0	2500	2000	76.0	100.0	3.05 HP

CESSNA AIRCRAFT COMPANY

HYDRAULIC PUMPS

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Pow Required @ No Load (150 PSI)
S.A.E. "C" SIZE 2- OR 4-BOLT MOUNTING FLANGE						
T20050	21.0	2500	2000	45	60	4
T20052	26.0	2500	2000	55	72	5
T20054	31.4	2500	2000	70	90	6
T20056	39.0	2300	2000	80	105	7
T20058	47.5	2100	2000	85	110	7.7
T20060	58.0	2000	1800	100	120	9
T20062	70.0	1800	1600	110	115	9.6
S.A.E. "B" SIZE 2-BOLT MOUNTING FLANGE						
P20709	12.3	3000	2000	34	52	2.9
P20710	14.9	2750	2000	36	45	3.1
P20711	18.0	2500	2000	39	49	3.5
P20712	21.6	2400	2000	46	58	4.0
P20713	26.2	2200	2000	51	65	4.4
L20100	4.9	3500	2000	14.8	18	1.4
L20102	6.0	3000	2000	15.3	19	1.4
L20104	7.2	3000	2000	18.5	23	1.7
L20106	8.7	2750	2000	20	27	1.9
L20107	10.0	2750	2000	24	30	2.1
L20108	10.7	2750	2000	25	32	2.3
L20109	11.7	2650	2000	26	35	2.4
L20110	13.0	2500	2000	28	37	2.5
L20111	14.2	2500	2000	30	39	2.7
L20112	15.2	2500	2000	32	41	3.0
L20113	17.5	2250	2000	33	42	3.0
L20114	18.5	2000	2000	33	40	2.8
S.A.E. "A" SIZE 2-BOLT MOUNTING FLANGE						
K20640	5.0	3000	2000	9.5	14	1.2
K20641	6.3	3000	2000	12.5	17	1.5
K20642	6.7	3000	2000	16.5	22	1.6
K20643	8.3	2750	2000	20.0	27	1.8
K20644	10.0	2600	2000	22.0	30	2.0
B15505	1.85	3000	2000	5	8	.5
B15506	2.24	3000	2000	6	9	.6
B15507	2.75	3000	2000	7	11	.7
B15508	3.4	3000	2000	8.5	13	.8
B15509	4.2	3000	200	10.5	15	1.0
B15510	5.1	3000	2000	12.5	18	1.2
B15511	6.1	3000	2000	15.0	21	1.4
B15512	7.3	2500	2000	15.0	22	1.4
B15514	8.8	2250	2000	17.0	22	1.5

*Rev. 6/25/68

COMMERCIAL SHEARING & STAMPING CO.

HYDRAULIC PUMPS

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI)
S.A.E. "A" FLANGE 2-BOLT MTG. & SPLINE DRIVE						
	CLOCKWISE ROTATION					
15H101 * * * * -- 6 ----201(ccw)	Available in gear widths from 1/2" to 2" in 1/4" increments from 3 to 14 gpm depending on gear width.					
		2000	2000 - depending on drive shaft torque limit.	23 gpm - 2" gear	30 - 2" gear width	Can be supplied for a specific model number upon request.
S.A.E. "B" FLANGE 2-BOLT MTG. & SPLINE DRIVE						
	CLOCKWISE ROTATION					
15H107 * * * * -- 16 ----207(ccw)	(Same notes apply as above.)					
30A196 * * * * -- 65 ----296(ccw)	Available in gear widths from 1" to 2" in 1/4" increments. from 10 to 20 gpm depending on gear width.					
1/8" NPT Drain Vent Optional		2400	2500 - depending on drive shaft torque limit.	40 gpm - 2" gear width	55 - 2" gear width	Can be supplied upon request for any specific model number.
50A196 * * * * -- 65 ----296(ccw)	Available in gear widths from 1" to 2-1/2" in 1/4" increments from 12 to 31 gpm depending on gear width.					
1/8" NPT Drain Vent Optional		2400	2500 - depending on drive shaft torque limit.	65 gpm - 2-1/2" gear width	110 - 2-1/2" gear width	Can be supplied upon request for specific model number.
25X197 * * * * -- 25 ---297(ccw)	Available in gear widths from 1/2" to 2-1/2" in 1/4" increments from 6-1/2 to 32 gpm depending on gear width.					
		2400	2000 - depending on drive shaft torque limit.	64 gpm - 2-1/2" gear width	90 - 2-1/2" gear width	Can be supplied upon request for specific model number.

COMMERCIAL SHEARING & STAMPING CO.

HYDRAULIC PUMPS

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI)
S.A.E. "C" FLANGE 2-BOLT MTG. & SPLINE SHAFT						
	CLOCKWISE ROTATION					
P50A199 **** -- 53 ----299 (ccw)	(See notes applying to P50A Series above.)					
P25X198 **** -- 7 ----298 (ccw)	(See notes applying to P25X Series above.)					
P37X198 **** -- 7 ----298 (ccw)	Available in gear widths from 1/2" to 3" in 1/4" increments from 7 to 45 GPM depending on gear width.					
		2400	2000	89 GPM - 3" GEAR WIDTH	122 - 3" GEAR WIDTH	Can be supplied upon request for specific model number.
P7SA198 **** -- 7 ----298 (ccw)	Available in gear widths from 1" to 3" in 1/4" increments from 19 to 57 GPM depending on gear width.					
		2400	2500	Can be supplied upon request for specific model number.		
S.A.E. "C" FLANGE 4-BOLT MTG. & SPLINE SHAFT						
	CLOCKWISE ROTATION					
P15H103 **** -- 19 ----203 (ccw)	(See notes applying to P15H Series above.)					
P50A178 **** -- 7 ----278 (ccw)	(See notes applying to P50A Series above.)					
P25X178 **** -- 7 ----278 (ccw)	(See notes applying to P25X Series above.)					
P37X178 **** -- 7 ----278 (ccw)	(See notes applying to P37X Series above.)					
P75A178 **** -- 7 ----278 (ccw)	(See notes applying to P75A Series above.)					

Notes:

1 - Asterisks above are substituted for actual letter coding which identify port size, types, and location

2 - All the above series of pumps are available in tandem assemblies each section of which conforms to the specifications outlined above.

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NEW YORK AIR BRAKE CO.
HYDRECO DIV. HYDRAULIC PUMPS

The series listed has available the correct mounting, shaft configuration, etc., for adapting to the transmission. Consult Hydreco Engineering Dept. regarding dual and tandem pumps.

Transmission	Pump Series
TT-TRT-1-2000	1400, 1500 Steer 1700, 2000 , 3100 Implement
CRT-3000 CRT-5000	2000, 3100, 3600
TT-TRT-4000	1700, 2000, 3100, 3600

VENTED PUMP FLANGE CAN BE PROVIDED AS OPTION ON ALL MODELS LISTED.

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI) 1200 RPM
1403	1.8	4000	3000	6.0	13.5	.32
1405	2.8	4000	3000	9.1	21.5	.475
1407	3.8	4000	3000	12.8	25.9	.63
1409	4.6	4000	3000	15.9	33.0	.78
1411	5.9	4000	3000	18.3	39.7	.94
1413	6.5	3600	2500	20.0	32.0	1.1
1506	3.1	3200	2000	8.6	13.4	.60
1508	4.7	3200	2000	13.0	20.5	.84
1510	5.3	3000	2000	14.0	21.5	.96
1512	7.2	2800	2000	16.7	23.0	1.2
1515	8.5	2800	2000	20.1	28.0	1.42
1517	9.7	2800	1500	24.0	24.0	1.68
1706	5.1	4000	3000	18	48.5	1.1
1707	6.4	4000	3000	22.2	39.0	1.42
1709	8.0	4000	3000	29.0	46.8	1.7
1711	10.2	4000	3000	35.6	60.5	2.20
1713	11.8	3200	3000	41.0	70.0	2.54
1715	14.1	2800	2500	32.8	58.0	2.92
2010	9.1	2600	2000	21.5	29	1.4
2012	11.4	2600	2000	26.5	40.1	1.5
2015	14.9	2600	2000	31.5	45	1.75
2017	16.1	2600	2000	37.7	50.1	2.05
2020	20.0	2600	2000	45.1	60	2.4
2025	25.1	2600	2000	59.5	56.2	2.9
3117	39.5	2800	2500	96	173	6.3
3120	42	2800	2500	109	198	7.1
3122	50.5	2800	2250	122	213	8.1
3125	56.5	2800	2000	135	190	9.0
3130	71	2800	1750	160	229	11.7
3135	82	2400	1500	166	189	12.5
3615	64.5	2400	2000	134	194	11.2
3620	84.0	2100	1750	148	202	14.7
3625	105.0	2100	1500	183	225	17.2

*Rev. 6/25/68

TYRONE HYDRAULICS INC.

HYDRAULIC PUMPS

	Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI)
A.)	20150	15	2500	2500	30.5	55	2.9
	20200	20	2500	2500	40.7	71	3.8
	20250	25	2500	2500	51.0	84	4.7
	20300	30	2500	2500	61.0	115	5.7
	20350	35	2500	2500	71.0	120	6.7
	20400	40	2500	2500	81.0	138	7.6
	20450	45	2500	2500	92.0	154	9.0
	25550	55	2500	2500	111.0	191	14.0
	25660	66	2500	2500	135.0	227	16.2
	25770	77	2500	2500	156.0	268	18.4
B.)	GPA2-45	4.5	3600	2250	14.5	21.5	2.0
	GPA2-65	6.5	3600	2250	19.6	30.0	2.75
	GPA2-85	8.5	3600	2250	25.5	40.2	3.75
	GPA2-105	10.5	3600	2250	28.8	50.2	4.5

Allison Transmission Model	Implement Pump	Steer Pump	Tyrone Pump Model	Tyrone Outline Drawing Number
TT-TRT-1000		GPA2-45	L	30984-2
TT-TRT-2000		GPA2-65	L	30984-2
		GPA2-85	L	30984-2
		GPA2-105	L	30984-2
	20150-thru 20450		G	31272-5
	25550-thru 25770		DD	41744
TT & TRT-4000	20150 thru 20450	20150-20450	G	31272-5
	25550 thru 25770	25550-25770	DD	41744
CRT-3000	20150 thru 20450	Not App.	G	31272-5
	25550 thru 25770		DD	41744
CRT-5000	20150 thru 20450	Not App.	G	31272-5
	25550 thru 25770		DD	41744

A.) VENTED PUMP FLANGE STANDARD ON ALL MODELS LISTED.

B.) VENTED PUMP FLANGE OPTIONAL ON ALL MODELS LISTED.

VICKERS INCORPORATED

This data shows maximum operating conditions of Vickers pumps under the most ideal conditions, but are not to be considered in any way as approval to use these products at these conditions. Consult Vickers Application Engineers for system evaluation and application approval.

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI)
TT-TRT-1-2-4000			VICKERS MODELS		CRT-3-5000	
S.A.E. 2 BOLT "A" MOUNTING			V200 M-PFB5 & 6 M-PVB5 & 6	- NOT APPLICABLE		
S.A.E. 2 BOLT "B" MOUNTING			V20 V2020 V30 25V 2520V 30V M-PFB10 & 15 M-PVB10 & 15 M-PFB20 & 29		S.A.E. 2 Bolt "B" Mounting Adapter Similar to Vickers Drawing 262037 Required on Transmission	
S.A.E. 2 BOLT " " MOUNTING		4000 Only	35V 3520V 3525V 45V 4520V 4525V 4535V M-PVB20 & 29	- NOT APPLICABLE	S.A.E. 2 Bolt "C" Mounting Adapter Similar to Vickers Drawing 261983 Required on Transmission	
FIXED DISPLACEMENT DOUBLE PUMPS S.A.E. "C" 2 BOLT MOUNTING						
			352-V Series			
3520V5*25*-69*10	5 24	2500	2500 2500	11 48	19 82	2 6
3520V14*38*-69*10	14 35	2400	2000 2500	28 70	37 120	4 9
			3525V Series			
3525V12*25-69*10	11.5 24	2500	2500	25.5 48	44 82	3 6
3525V21*38-69*10	20 35	2400	2500	40.5 70	70 120	5 9
			4520V Series			
4520V5*42-68*10	5 42	2200 2200	2500 2500	11 73	19 120	2 9
4520V14*60-68*10	14 60	2200 2200	2000 2500	28 105	37 165	4 11

NOTE: Only minimum and maximum displacement combinations shown.

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Powe Required @ No Load (150 PSI)
FIXED & VARIABLE DISPLACEMENT SINGLE PUMPS S.A.E. "C" 2-BOLT MOUNTING						
			35V Series			
35V25*-25*10	24	2500	2500	48	82	6
35V30*-25*10	28	2500	2500	57	100	8
35V35*-25*10	34	2400	2500	66	110	9
35V38*-25*10	35	2400	2500	70	120	9
			45V Series			
45V42*-25*10	42	2200	2500	73	120	9
45V50-25*10	48	2200	2500	84	140	10
45V60-25*10	60	2200	2500	105	165	11
		M-PVB29 Piston Pump - Variable Displacement				
M-PVB20-*G10-*10	13.5	2400	3000	25	52	2 - 4
M-PVB29-*G10-*10	19	2000	2500	32	54	2 - 4
FIXED & VARIABLE DISPLACEMENT SINGLE PUMPS S.A.E. "B" 2-BOLT MOUNTING						
			V30 Series			
V30-1*15*-24*20	14	2700	2500	32	55	4
V30-1*17*-24*20	16	2600	2200	35	55	5
V30-1*21*-24*20	20	2500	2200	39	60	5
V30-1*24*-24*20	22.5	2400	2200	41	64	5
V30-1*28*-24*20	27	2200	2200	44	65	5
		M-P*B10 & 19 Series Piston Pumps - Fixed Displacement				
M-PFB10-*G-20	7	3600	4000	18	52	5
M-PFB15-*G-20	9	2800	2500	23	38	5.5
M-PVB10-*G-20*10	7	3600	3000	19	40	1.0 - 3.0
M-PVB15-IG-20*10	9	2800	2000	23.5	32	1.0 - 3.0
		M-P*B20 & 29 Series Piston Pumps - Fixed & Variable Displacement				
M-PFB20-*G10	13.5	2400	4000	24	70	5
M-PFB29-*G10	19	2000	3000	31	64	5.5

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Power Required @ No Load (150 PSI)
FIXED DISPLACEMENT DOUBLE PUMPS S.A.E. "B" 2-BOLT MOUNTING						
			V2020 Series Double Pump			
Min. Comb.						
V2020-1*6*6*-24**10	5.5	3400	2500	16.2		
	5.5			16.2	60	2.0
Max.						
V2020-1*13*11*-24**	12.8	2400	2200	26		
10	10.8			23	75.5	6.0
			252*V Series Double Pump			
Min. Comb.						
252*V5*12-69*10	5	2700	2500	11	21	
	12			25	44	5
Max.						
252*V14*21-69*10	14	2500	2000	31	42	
	20		2500	41	70	10
NOTE: Only minimum & maximum displacement combinations shown.						
FIXED & VARIABLE DISPLACEMENT SINGLE PUMPS S.A.E. "B" 2-BOLT MOUNTING						
			V20 Series			
V20-6*6*-24*10	5.5	3400	2500	16.2	30	2.0
V20-6*8*-24*10	7.7	2800	2500	17.7	33	2.0
V20-6*9*-24*10	8.5	2800	2500	20.0	36	2.5
V20-6*11*-24*10	10.8	2500	2500	23.0	38	3.0
V20-6*13*-24*10	12.8	2400	2200	26.0	38.5	4.0
			25V Series			
25V12*-69*10	11.5	2700	2500	25.5	44	3
25V14*-69*10	13	2700	2500	29	51	3.5
25V17*-69*10	16	2500	2500	33	57	4
25V21*-69*10	20	2500	2500	40.5	70	5
			30V Series			
30V24*-69*10	23	2000	2000	38	52	5
30V28*-69*10	27	2000	2000	44	61	5

Pump Model No.	Delivery @ 1200 RPM 1000 PSI SAE Rating	Max. Speed RPM	Max. Pressure PSI	Approximate Delivery @ Max. Speed & Pressure	Approximate Input HP @ Max. Speed & Pressure	Pump Powe Required @ No Load (150 PSI)
FIXED & VARIABLE DISPLACEMENT SINGLE PUMPS S.A.E. "A" 2-BOLT MOUNTING						
		V210 Series Single Pump				
V210-2-52*-12	1.8 GPM	3000 2000	1000 1500	5.7 3.0	5.3 5.2	0.5 0.5
V210-5-52*-12	4.7 GPM	2400	2000	9.8	16.0	1.0
V210-6-52*-12	6.0 GPM	2400	2000	12.0	18.5	1.3
V210-8W-52*-12	7.3 GPM	2200	2000	13.3	20.0	2.0
V210-9-52*-12	9.0 GPM	2000	2000	14.0	22.0	2.0
V210-11W-52*-12	10.0 GPM	2000	2000	17.3	26.5	3.0
	M-P*B5 Series Piston Pump - Fixed & Variable Displacement					
M-PFB5-*G-11	3.0	3600	4000	8.0	26	3.0
M-PFB6-*G-11	3.8	3200	2500	10.0	23	1.0 - 3.(
M-PVB5-*G-11*11	3.0	3600	3000	8.8	20	4.0
M-PVB6-**G-11*11	3.8	3200	2000	10.5	15	1.0 - 3.(

Allison Transmissions

Date 3/78 No. 42, Rev.K

HYDRAULIC FLUID RECOMMENDATIONS

FOR

ALL ALLISON COMMERCIAL AND MILITARY TRANSMISSIONS

AND INDUSTRIAL TORQUE CONVERTER ASSEMBLIES

Recent surveys of Powershift Transmissions and Industrial Torque Converters in new and projected vehicle applications have revealed some Dexron® II, Type C-2 oils and engine oil formulations will have lower friction retention properties than desired. As a result of these findings, a new C-3 specification has been developed to span those heavier and more severe duty operations anticipated.

A listing of the new Type C-3 transmission fluids commercially available to date (see date on list) is attached hereto for your convenience. If listed, Dexron® type or Type C-2 oil referenced in the listing is a qualified Type C-3 based on the supplier's certification to Detroit Diesel Allison. Commercial Universal Farm Tractor fluids acceptable to date are defined and listed on page 13 of 13. The publication of the oil listing is not to be construed as a specific endorsement by Detroit Diesel Allison Division or General Motors Corporation of the products.

Dexron® or Dexron® II transmission fluids remain the only fluid recommended for Detroit Diesel Allison automatic transmissions (except CL(B)T 700 Series). The AT, MT, HT, and V Series transmissions are Automatic models; all others are Powershift. The CL(B)T 700 transmissions are automatics; but due to vehicle applications, Type C-3 oil should be used.

Oil recommendations for prevailing ambient temperature are as follows:

A. Commercial Automatic Transmissions

AT-MT-HT-V

Prevailing Ambient Temperature	Recommended Oil Specification
Above -30°F	DEXRON®/DEXRON® II Transmission Fluid
Below -30°F	DEXRON®/DEXRON® II Transmission Fluid

A. Commercial Automatic Transmissions (Continued)

CAUTION: The -30°F sump temperature specification is based on cold engine operation. Even if the engine is warm and capable of full throttle output, the transmission should not be operated for 30 seconds to allow for buildup of sufficient main pressure.

NOTE: Ford Motor Company's assembly line oil fill is with Ford Type F fluid. It is permissible to continue using either Type F fluid conforming to the latest Ford specification or Dexron® /Dexron® II following delivery. These fluids may be intermixed.

CLT, CLBT 750

Prevailing Ambient Temperature	Recommended Oil Specification
Above -10°F	Hydraulic Transmission Fluid, Type C-3
Below -10°F	Hydraulic Transmission Fluid, Type C-3 Auxiliary preheat required to raise temperature in the sump to a temperature above -10°F.

B. Commercial Powershift Transmissions and Industrial Torque Converters

Prevailing Ambient Temperature	Recommended Oil Specification
Above -10°F	Hydraulic Transmission Fluid, Type C-3 (Except Grade 30).
Below -10°F	Hydraulic Transmission Fluid, Type C-3 (Except Grade 30). Auxiliary preheat required to raise temperature in the sump to a temperature above -10°F.
Above 32°F	Hydraulic Transmission Fluid Type C-3 or Type C-3, Grade 30.

C. Military Transmissions, Commercial Powershift Transmissions, Commercial Automatic Transmissions and Industrial Torque Converters in Military Applications

Prevailing Ambient Temperature	Recommended Oil Specification
Above -10°F	MIL-L-2104 Grade 10 to latest specification, or Hydraulic Transmission Fluid Type C-3.
0°F to -65°F	MIL-L-10295 to latest specification.

NOTE: If auxiliary preheating equipment is available and the sump temperature can be raised to -10°F, it is recommended that MIL-L-2104 Grade 10 oil be used. When changing to oil of different grade, thoroughly flush system with grade oil to be used before refilling.

CAUTION: Do not use MIL-L-10295 when the ambient temperature is consistently above -10°F.

DETROIT DIESEL ALLISON DIVISION, GMC

QUALIFIED LIST OF TYPE C-3 TRANSMISSION FLUIDS

THIS LIST OF COMMERCIALLY AVAILABLE C-3 TRANSMISSION FLUIDS IS COMPILED BY DETROIT DIESEL ALLISON DIVISION AS A SERVICE TO MANUFACTURERS, OWNERS, AND OPERATORS OF EQUIPMENT USING ALLISON TRANSMISSIONS. IT IS BASED ON CERTIFICATION OF DATA TO DETROIT DIESEL ALLISON BY A RESPONSIBLE OFFICER OF THE RESPECTIVE SUPPLIERS OF THESE FLUIDS EVIDENCING COMPLIANCE WITH THE ALLISON C-3 SPECIFICATION.

RESPONSIBILITY FOR THE QUALITY OF A HYDRAULIC FLUID AND ITS PERFORMANCE MUST REMAIN WITH THE OIL COMPANY MAKING THE PRODUCT.

SINCE NEW PRODUCTS ARE CONTINUOUSLY BEING TESTED BY THE OIL INDUSTRY, REVISED LISTS WILL BE MADE AVAILABLE FROM TIME TO TIME. NEW PRODUCTS THAT HAVE BEEN VERIFIED BY THE FLUID SUPPLIER AS MEETING THE ALLISON APPROVED C-3 SPECIFICATION WILL BE INCLUDED IN THESE REVISED LISTS.

IT IS PERMISSIBLE FOR A LISTED MARKETER TO DUPLICATE THIS LISTING PROVIDED HE INDICATES ON THE REPRODUCTION THAT IT IS A COMPLETE REPRINT OF THE ORIGINAL.

September 1977

THE FOLLOWING OILS CONFORM TO DETROIT DIESEL
ALLISON C-3 GRADE 10W AND GRADE 30 SPECIFICATIONS

OIL GRADES ARE INDICATED AS FOLLOWS

GRADE 10W *
GRADE 30 ***

SEPTEMBER 1977

---A---

MARKETER	TRADE NAME
AGIP S.P.A.	* AGIP F.1 DIESEL GAMMA SAE 10W
	* AGIP F.1 DIESEL SIGMA SAE 10W
	*** AGIP F.1 DIESEL SIGMA SAE 30
AMALIE REFINING CO.	* AMALIE HD-1 MOTOR OIL SAE 10W
AMERICAN PETROFINA CO. OF TEXAS	* FINA C-3 TRANSDRAULIC FLUID FOR ALLISON
	* FINA ALLISON HYDRAULIC TRANSMISSION TYPE C-3 FLUID CODE 9720
AMOCO OIL COMPANY	* AMOCO FLUID TYPE C-2
	* AMOCO C-3 FLUID
AMPOL PETROLEUM LIMITED	* AMPOL HYDRAULIC TRANSMISSION FLUID TYPE C-3, SAE 10W
ANTAR S.A. ET COMPAGNIE	* MILANTAR 3C 10W
	* TRANSANTAR C 3
ARKLA CHEMICAL CORPORATION	* ARKLA TC-252
ATLANTIC RICHFIELD COMPANY	* ARCO C-3 FLUID
	* ARCOFLEET MS-3

---B---

BENZ OIL INC.	* BENZ C-3 TRANSMISSION FLUID
BORON OIL CO.	* FACTO 10W

---B---

MARKETER	TRADE NAME
BP AUSTRALIA LIMITED	* BP AUTRAN C-3
BP OIL INC.	* VANNELLUS MCS-3 10W * BP HYDRAULIC TF-C3
BP OIL LIMITED	* BP DIESEL S3 SAE 10W
BP TRADING LIMITED	* BP VANELLUS C3 SAE 10W *** BP VANELLUS C3 SAE 30 * BP AUTRAN GM-MP

---C---

CALTEX PETROLEUM CORPORATION	*** CALTEX RPM DELO 400 OIL SAE 30 * CALTEX RPM TORQUE FLUID NO. 5
CASTROL AUSTRALIA PTY., LTD.	* CASTROL TRANSMISSION FLUID TYPE C-3 10W 20
CASTROL LIMITED	* CASTROL/DEUSOL TFC 310 *** DEUSOL TFC 330
CATO OIL AND GREASE CO.	* C-3 TRANSDRAULIC FLUID FOR ALLISON
CHAMPLIN PETROLEUM COMPANY	* CHAMPLIN S-3 PLUS MOTOR OIL (SAE 10W)
CHEVRON OIL CANADA, LTD	* CHEVRON DELO 400 MOTOR OIL (SAE 10W) *** CHEVRON DELO 400 MOTOR OIL (SAE 30) * CHEVRON TORQUE FLUID 5
CHEVRON OIL EUROPE, INC.	* CHEVRON TORQUE FLUID 5
CHEVRON U.S.A. INC. (CHEVRON OIL COMPANY)	* CHEVRON DELO 400 MOTOR OIL (SAE 10W) *** CHEVRON DELO 400 MOTOR OIL (SAE 30) * CHEVRON TORQUE FLUID 5
CITIES SERVICE COMPANY	* CITGO TORQUE CONVERTER FLUID 250
COMPAGNIE FRANCAISE DE RAFFINAGE	* TOTAL ATF H 5017
COMPANHIA ATLANTIC DE PETROLEO S/A	* "HT FLUID" - TYPE C-3

---C---

MARKETER	TRADE NAME
COMPANIA PETROLERA CHEVRON	* CHEVRON DELO 400 MOTOR OIL (SAE 10W) *** CHEVRON DELO 400 MOTOR OIL (SAE 30) * CHEVRON TORQUE FLUID 5
COMPANIA PETROLERA CHEVRON, INC.	* CHEVRON DELO 400 MOTOR OIL (SAE 10W) *** CHEVRON DELO 400 MOTOR OIL (SAE 30) * CHEVRON TORQUE FLUID 5
COMPANIA PETROLERA CHEVRON, LTD.	* CHEVRON DELO 400 MOTOR OIL (SAE 10W) *** CHEVRON DELO 400 MOTOR OIL (SAE 30) * CHEVRON TORQUE FLUID 5
CONTINENTAL OIL COMPANY	* CONOCO POLAR START DN-600 FLUID * CONOCO HYDRAULIC TRANSMISSION FLUID, TYPE C-3

---D---

D-A LUBRICANT COMPANY, INC.	* D-A TORQUE FLUID * D-A DIESEL PLUS OIL, SAE 10W GRADE *** D-A DIESEL PLUS OIL, SAE 30 GRADE
DAVIS-HOWLAND OIL CORP.	* DSL TORQUE FLUID C-3
DELTA PETROLEUM CO., INC.	* FIVE STAR ALLISON C-3
DRYDEN OIL COMPANY, INC.	* TORQUE FLUID C-3 (1204) * TORQUE FLUID C-3 (DEXRON TYPE) (1906) * DRYDEN SUPREME XHD-10

---E---

ESSO AUSTRALIA LTD	* ESSO TORQUE FLUID 47
ESSO BRASILEIRO DE PETROLEO S.A.	* ESSO TORQUE FLUID 47
ESSO CHILE S.A. PETROLERA	* ESSO TORQUE FLUID 47
ESSO EUROPE INC. AFFILIATES	* ESSO TORQUE FLUID 47

---E---

MARKETER	TRADE NAME
EXXON COMPANY U.S.A.	* TORQUE FLUID 47
	* XD-3, SAE 10W

---F---

FARMLAND INDUSTRIES, INC.	* CO-OP DIESEL ENGINE OIL, SAE 10W
FS SERVICES, INC.	* FS SUPER LUBE SAE 10-10W

---G---

GOLDEN BEAR DIVISION OF WITCO CHEMICAL CORPORATION	* GOLDEN BEAR "CODE 510"
	*** GOLDEN BEAR "CODE 513"
GOLDEN FLEECE	* AUTOFLOW C3 10
GULF OIL CANADA LIMITED	* GULF LOW ASH SUPER DUTY MOTOR OIL 5W 20
	* GULF LOW ASH SUPER DUTY MOTOR OIL 10W
	*** GULF LOW ASH SUPER DUTY MOTOR OIL 15W-40
	* GULFLUBE MOTOR OIL X.H.D. 5W-20*
	* GULFLUBE MOTOR OIL XHD SAE 10W
	* GULF SUPER DUTY MOTOR OIL 10W
GULF OIL CORPORATION	* GULF HT FLUID C-3

---I---

IMPERIAL OIL LIMITED	* ESSOLUBE HDX PLUS 10W
	* ESSOLUBE HDX PLUS 5W 20
	* ESSOLUBE XD-3 10W
	* ESSO HYDRAULIC OIL XD-3 10W
	*** ESSOLUBE XD-3 15W-40
	* HYDRAUL 50

MARKETER	TRADE NAME
KENDALL REFINING COMPANY	* KENDALL F-L SELECT MOTOR OIL
KERR-MCGEE REFINING CORPORATION	* C-3 TRANSDRAULIC FLUID FOR ALLISON
---L---	
LION OIL COMPANY SUBSIDIARY OF THE OIL SHALE CORPORATION	* LION C-2/C-3 FLUID
---M---	
MARATHON OIL COMPANY	* MULTIPOWER -3 MOTOR OIL SAE 10W
MID-STATES DISTRIBUTING CO.	* C-3 TRANSDRAULIC FLUID FOR ALLISON
MOBIL OIL CORPORATION	* POWER FLUID C-2 * MOBIL DELVAC 1310 *** MOBIL DELVAC 1330 * MOBILFLUID 423 * MOBIL ATF 200
MOBIL USA	* MOBIL DELVAC 1210 *** MOBIL DELVAC 1230 * POWER FLUID C-2 * MOBIL DELVAC 1310 *** MOBIL DELVAC 1330 * MOBILFLUID 423 * MOBIL ATF 200
MORRIS & COMPANY (SHREWSBURY) LTD.	* GOLDEN FILM LIQUIMATIC C-3
---N---	
AB NYNAS-PETROLEUM. STOCKHOLM. SWEDEN	* NYNAS HTF C3
---P---	
PACER LUBRICANTS. INC.	* PACER ALLISON C-2. C-3 FLUID

---P---

MARKETER	TRADE NAME
PENNZOIL COMPANY	* PENNZOIL C-2/C-3 FLUID
PENTALUBE OIL, INC.	* PENTA TORQUE CONVERTER OIL TYPE C-3
PETROFINA S.A., BRUSSELS & AFFILIATED COMPANIES	* FINA TRANSMISSION OIL C 3
PETROL OFISI	*** UNIVERSAL MOTOR YAGI D SAE-30
PETROLEO BRASILEIRO S.A. PETROBRAS	* LUBRAX MD 300 SAE 10W
PETROTORQUE	* PETROTORQUE 47
PHILLIPS PETROLEUM COMPANY	* TYPE C-2/C-3 FLUID * SUPER HD II MOTOR OIL * SUPER HD MOTOR OIL
PRIMROSE OIL COMPANY	* PRIMROSE #253 C-2/C-3 HYDRAULIC TRANSMISSION FLUID

---S---

SHELL BRASIL S/A (PETROLEO)	* SHELL TRANSMIFLUIDO
SHELL CANADA LIMITED	* SHELL ARCTIC CL-1082 (5W 20) * SHELL RIMULA CT OIL SAE 10W * SUPER U 10W
SHELL INTERNATIONAL PETROLEUM COMPANY LIMITED	* SHELL DONAX TM * SHELL RIMULA CT OIL 10W *** SHELL RIMULA CT OIL 30
SHELL OIL COMPANY	* DONAX T-5, CODE 53005 * SHELL HYDRAULIC FLUID C-3, CODE 53105 * RIMULA U SAE 10W *** RIMULA U SAE 30
SHELL OIL SOUTH AFRICA (PTY) LIMITED	* SHELL RIMULA CT OIL 10W * DYNASHELL MARK II 10W

---S---

MARKETER	TRADE NAME
SOLENE LUBRICANTS, INC.	* SOLENE C-2 FLUID * SOLENE C-3
SOUTHWEST GREASE & OIL CO. (WICHITA), INC.	* HYDRAULIC TRANSMISSION FLUID C-3 * MOTOR OIL SAE 10W SE-CD
STANDARD OIL CO. (OHIO)	* FACTO 10W
J. D. STREETT & CO., INC.	* ZEPHYR SUPER HEAVY SAE 10-10W
SUN PETROLEUM PRODUCTS COMPANY (DIV. OF SUN COMPANY, INC.)	* SUNFLEET C-2/C-3 FLUID * SR ATF C-2/C-3 TYPE *** SUNFILL C2 30
SUNOCO INCORPORATED	* SUNOCO TRANSMISSION FLUID C-2/C-3 * SUNFLEET C-2/C-3 FLUID
SUN OIL COMPANY (BELGIUM)NV	* SUNOCO TRANSMATIC FLUID TYPE A SUFFIX A

---T---

TEXACO BRAZIL S.A.	* TORQUE FLUID C-3
TEXACO, INC.	* TORQUE FLUID C-3 * TRANSHYDRAL FLUID * URSA SUPER PLUS (10W) *** URSA SUPER PLUS (15W 40) *** URSA SUPER PLUS SAE-30 * URSA OIL SUPER 3 SAE-10W *** URSA OIL SUPER 3
TEXACO SERVICES (EUROPE) LTD.	* URSA OIL S-3 SAE-10W
TURBO REFINERIES LTD.	* TURBO AUTOMATIC TRANSMISSION FLUID "TYPE A"

---U---

MARKETER		TRADE NAME
UNION OIL COMPANY OF CALIFORNIA	*	UNION C-3 FLUID
	***	UNION C-3 FLUID
UNITED OIL COMPANY, INC.	*	DURALENE TYPE C-3

---V---

VALVOLINE OIL COMPANY	*	VAL-TORQUE C-3
	***	VALVOLINE UNITRAC FLUID
VALVOLINE (AUSTRALIA) PTY. LIMITED	*	VAL-TORQUE C-3
VISCOSITY OIL COMPANY	*	INTERNATIONAL HARVESTER "IH NO. 1 ENGINE OIL SAE 10W"

---W---

WESTLAND OIL COMPANY	*	WESTLAND DURA C-3 TRANS FLUID
WM. PENN	*	MULTI-SERVICE FLEET ENGINE OIL 10W
WOLF'S HEAD OIL REFINING CO.	*	WOLF'S HEAD AUTOMATIC TRANSMISSION FLUID C-3

INTERMEDIATE VISCOSITY FLUIDS

CERTAIN COMMERCIAL UNIVERSAL FARM TRACTOR FLUIDS MEET ALL OF THE REQUIREMENTS FOR HYDRAULIC TRANSMISSION FLUID, TYPE C-3, BUT DO NOT FALL WITHIN THE DEFINED VISCOSITY LIMITS FOR GRADE 10W OR GRADE 30. SUCH LUBRICANTS WILL PERFORM SATISFACTORILY IN DETROIT DIESEL ALLISON OFF-HIGHWAY TRANSMISSIONS WHEN USED ABOVE +10 DEGREES F.

MARKETER	TRADE NAME
---D---	
D-A LUBRICANT COMPANY, INC.	D-A HYDRATRANS 135
---I---	
IMPERIAL OIL LIMITED	HYDRAUL 56

Allison Transmissions

Sales Brief

Date April, 1977 No. 56 B

PAINT SPECIFICATIONS

The paints presently used on Allison commercial transmissions are as follows:

TMS #26670 - Enamel Primer-Yellow-Air Drying
TMS #27580 - Alpine Green Primer-Air Drying

General Technical Requirements:

Enamel shall be of uniform consistency and free from bubbles, toxic ingredients, grit, rough particles, and floating or caked pigments. Component ingredients shall be intimately mixed, and processed as required to produce a product which is stable and not subject to abnormal change with age in sealed containers.

In addition to the above, TMS #26670 Specification covers the following items:

Type	Film Properties
Application	Leveling
Composition	Color
Coarse Particles	Drying
Viscosity	Salt Spray Resistance
Skinning and Livering	Transmission Oil Resistance
PH Reading	Adhesion

TMS #27580 Specification covers the following items:

Type	Film Properties
Application	Leveling
Composition	Color
Coarse Particles	Drying
Viscosity	Salt Spray Resistance
Skinning and Livering	Transmission Oil Resistance
PH Reading	Adhesion

Note: Tests are made regularly on incoming paint shipments by our Materials Laboratory to insure that the paint used by Allison is of good quality and meets our Specifications TMS #26670 and TMS #27580 as referenced above.

Requirements for special paint and painting procedures can be complied with; however, such requests should be reviewed with Allison prior to the submitting of a bid for a military contract or ordering units from Allison since it will be necessary to review all special procedures in detail to determine if any additional costs will be involved.

We are of the opinion that the past acceptance by the military of units painted in accordance with Allison Specifications TMS #26670 and 27580 attests the high quality and reliability of our paint, painting procedures and facilities.

MIL-T-704E, Amendment 1, Paragraph 3.3.10 pertains to the internal painting of housings, etc., with a crankcase sealer prior to assembly. We do not recommend this procedure as our previous experience has indicated that the application of such a sealer may have a detrimental effect on transmission operation and service life because the compound has a tendency to flake off and contaminate the hydraulic system, clog valves and oil passages.

If you have any questions concerning the above information or any specific paint requirements with reference to Detroit Diesel Allison converters and/or transmissions, please contact the Sales Department 7341, P. O. Box 894, Indianapolis, Indiana 46206.

Sales Development

Allison Transmissions

Sales Brief

Date 2/1/65 No. 65

Recommendations for Driveline Angularity

For All Off-Highway Transmissions And Converters

This Sales Brief is being issued to supply Engineering recommendation for maximum driveline angularities on all commercial off-highway transmissions and converters.

It is well to note that the following limitations are maximum and in any case it is recommended good practice to keep driveline angles to a minimum.

On the straight through version of the 3341 and 3441, a "drive line angularity not to exceed 5° is recommended". This applies to speeds up to 2500 RPM input. Above 2500 RPM, the attached chart, Figure VII-2 on Page 6 applies.

DRIVELINES

To insure maximum driveline life, minimum vibrations in the vehicle, and to prevent excessive torsionals and forces from being fed into the transmission, it is very important to follow design criteria as recommended by the driveline manufacturer. It is equally important that for each particular installation, sufficient information be provided to the driveline manufacturer to aid in the driveline selection. This information should include:

- Vehicle work cycle
- Maximum driveline speed
- Maximum driveline torque
- Driveline length and angles

Although the driveline manufacturer will analyze the data for each specific installation and make recommendations accordingly, there are several factors that can be examined prior to reviewing the installation with the driveline manufacturer. Many of these factors, including rating, angles, indexing and balance, and slip joints are discussed in this section. This information is based on experienced gained by various driveline manufacturers and is intended only as a general guide for planning driveline installations.

There are two main types of drivelines - the Cardan (cross type) and constant velocity type. The Cardan driveline is most commonly used; however, in certain cases, the constant velocity driveline may be advantageous. This type driveline is generally used where extreme angles cannot be avoided. Since the constant velocity driveline is used in special applications, the remainder of this section is devoted to the more common Cardan (cross type) driveline.

A. Rating

The length and maximum driveline speed will determine the shaft size required to prevent shaft "whip". Figure VII-1 is a typical nomogram for selecting shaft tubing size by shaft length and maximum speed. Also, it is important that the shaft have sufficient capacity to withstand maximum transmission output torque. Generally, driveline torque capacity is rated for continuous and intermittent operation, and include a torsional yield limit.

B. Angles

Drivelines, as applied to vehicles, may be classified as input (between engine and transmission) and output (from the transmission to the vehicle wheels). In either case, it is good practice to keep driveline angles to a minimum, since extreme angles can cause torsional activity detrimental to the transmission as well as other driveline components. A typical chart showing the relationship between driveline speed and permissible driveline angle is illustrated in Figure VII-2.

Experience has shown that for remote mounted transmissions, the input driveline angles should be kept to a minimum and never be allowed to exceed 4 degrees. The potential problem that might result from excessive input driveline angles will be discussed in the Torsional Section.

Equal angles must be maintained at both ends of any propeller shaft so that the non-uniform motion of the shaft will be cancelled. To obtain equal angles for a driveline in which one member of the driveline moves relative to the other - such as in an off-highway truck - it is necessary that the driveline be installed so that the flanges are parallel. A typical driveline of this type is shown at the top of Figure VII-3 and it may be seen that vertical movement of either flange will still yield equal angles at A and B.

In some installations, the axle and suspension system will allow the flange to rotate through an arc between a maximum and minimum position which will cause the flanges to be out of parallel in some positions. Experience has shown that with the trend toward soft springs, air suspension, etc., it is important to set the flanges parallel in the nominal axle position. The nominal axle position is defined as the average between the empty and gross vehicle weight. Included at the bottom of Figure VII-3 is a chart for determining allowable driveline angle variation. The maximum deviation from the nominal driveline angle is plus or minus three increments on the variation scale.

For driveline configurations that have both ends fixed - such as an oil well pumping rig - equal angles can be obtained with either parallel or non-parallel flanges. The lower sketch in Figure VII-3 shows a typical driveline of this type and the flanges must remain fixed to insure equal angles at C and D.

Occasionally, it is necessary to use a three joint driveline similar to the one shown at the top of Figure VII-4. In installations of this type, it is very important that certain driveline angles be maintained. The chart shown in Figure VII-4 is a typical nomogram for determining the angle of the middle joint when the angle of the other two joints are known. To use the chart, locate angles A and C on nomogram and connect with straight line. The intersection of the line is ideal joint angle B, and the maximum deviation from ideal angle B is plus or minus three increments on variation scale b.

C. Indexing and Balance

Normally, the universal joint at each end of a propeller shaft should be indexed so that the yokes are in the same plane. Misindexing could cause torsional as well as noise problems. However, there have been instances that a slight degree of misindexing was necessary to correct a specific torsional or noise problem. Of course, if a change such as this is contemplated, the driveline manufacturer must be consulted.

Driveline balance is controlled by the driveline manufacturer. It is important to provide the driveline manufacturer with the maximum driveline speed so that the shafting will be balanced at this speed. Also, experience has indicated that all shafting should be balanced to within 3 oz.in.

D. Slip Joints

In order to absorb axial travel that may result from power package and/or axle movements, slip joints are required in the driveline. In general, the axial loads transmitted to the transmission or axle are proportional to the amount of torque on the shaft. Therefore, under high torque conditions, a larger axial force will be transmitted before the joint will slip.

Experience has shown that the transmission bearings have sufficient capacity to handle normal driveline axial loads transmitted through slip joints. However, with the introduction of vehicles with unusual driveline arrangements - such as pivot steer loaders - it is suggested that the axial forces be supplied to Allison for engineering review.

PROCEDURE

1. Locate proper tube size on line "A"
2. Locate proper shaft length on line "C" *
3. Connect points on lines "A" and "C" with straight line
4. Read answer on line "B" at point of intersection

* Length "C" ... For two joint assembly - $\mathbb{C}_L$ to $\mathbb{C}_L$ of joints.
For joint and shaft - $\mathbb{C}_L$ of joint to $\mathbb{C}_L$ of center bearing.

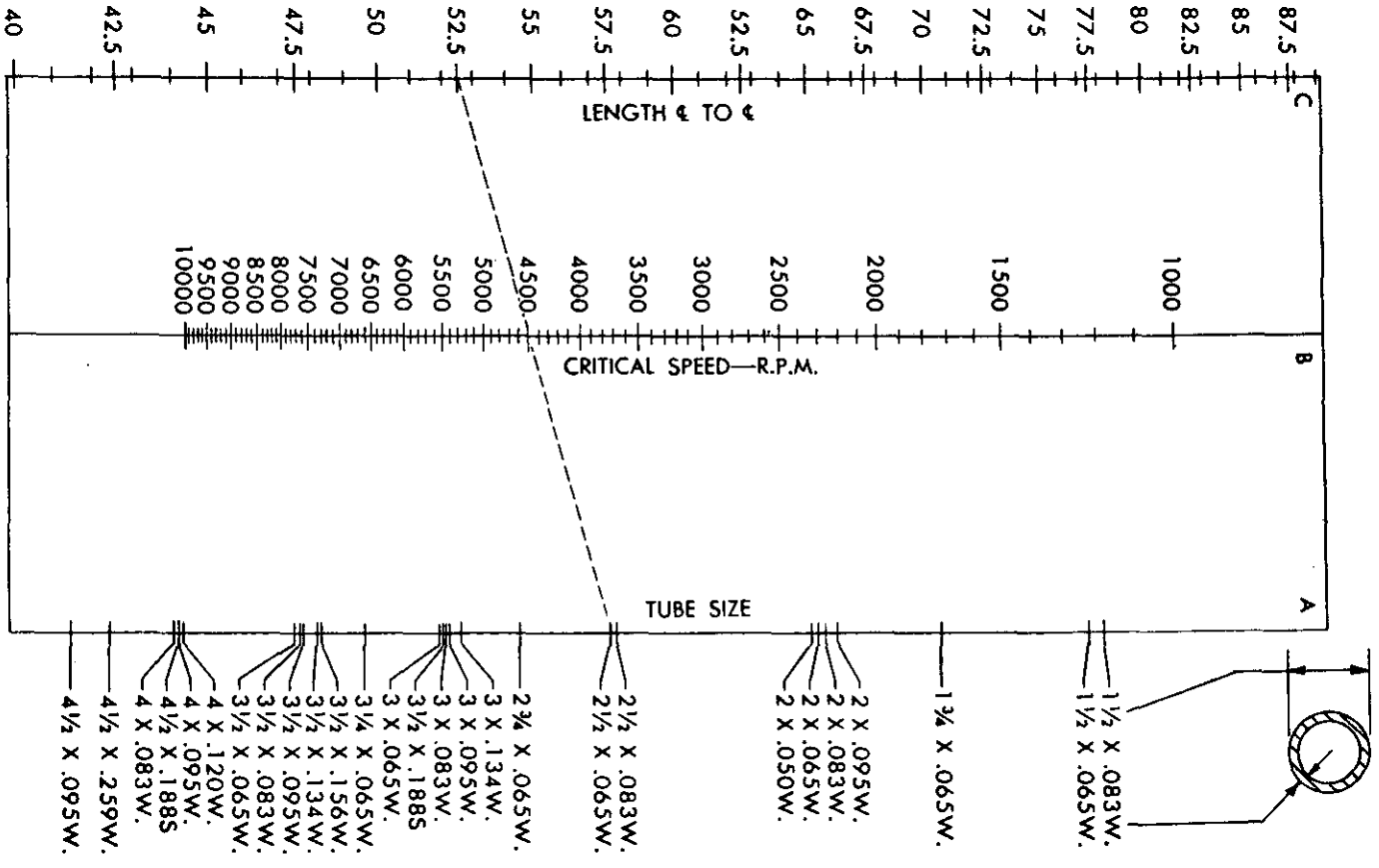


Figure VII-1 Nomogram for Determining Driveline Size by Length and Speed

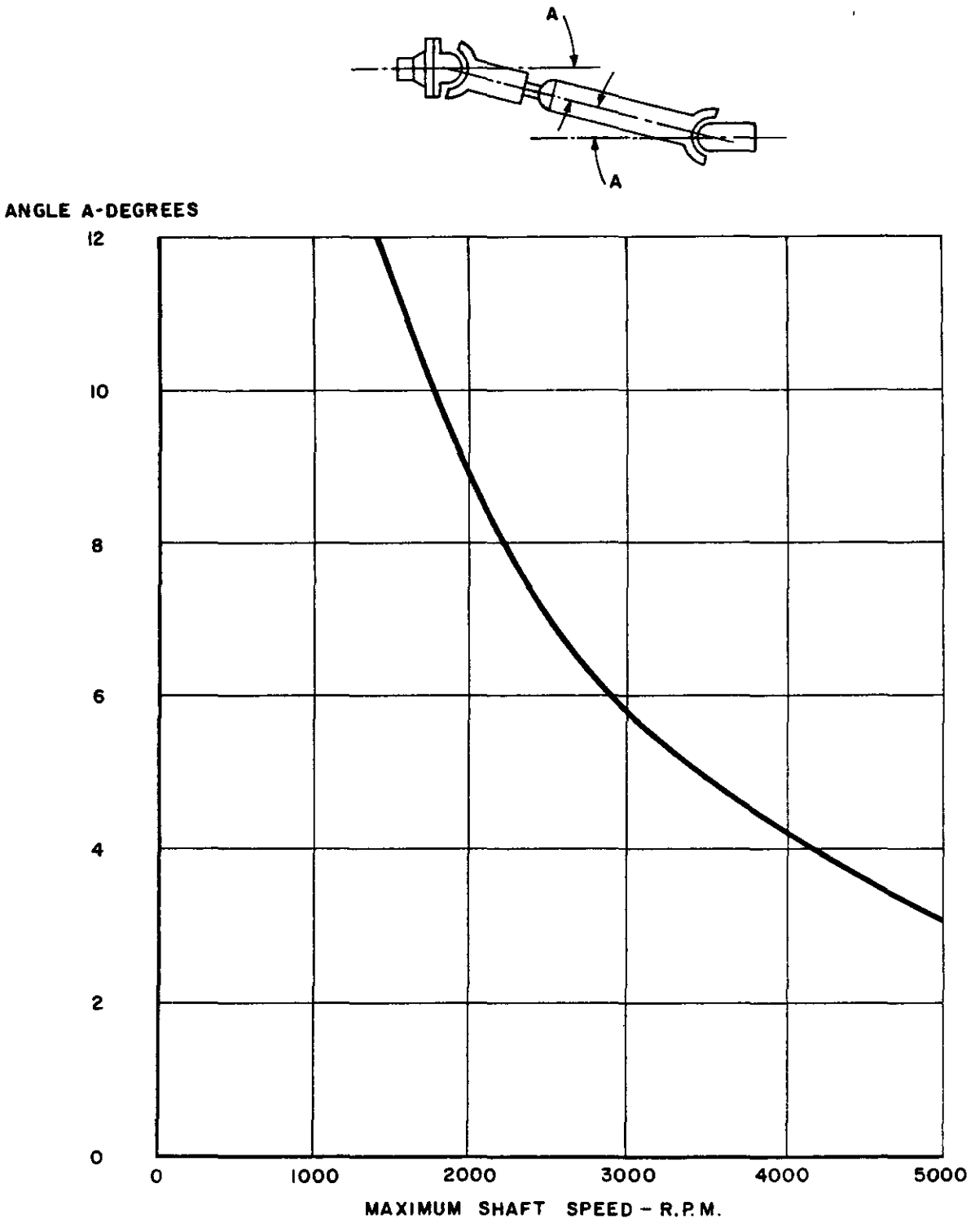


Figure VII-2 Typical Relationship Between Maximum Driveline Speed and Allowable Driveline Angle

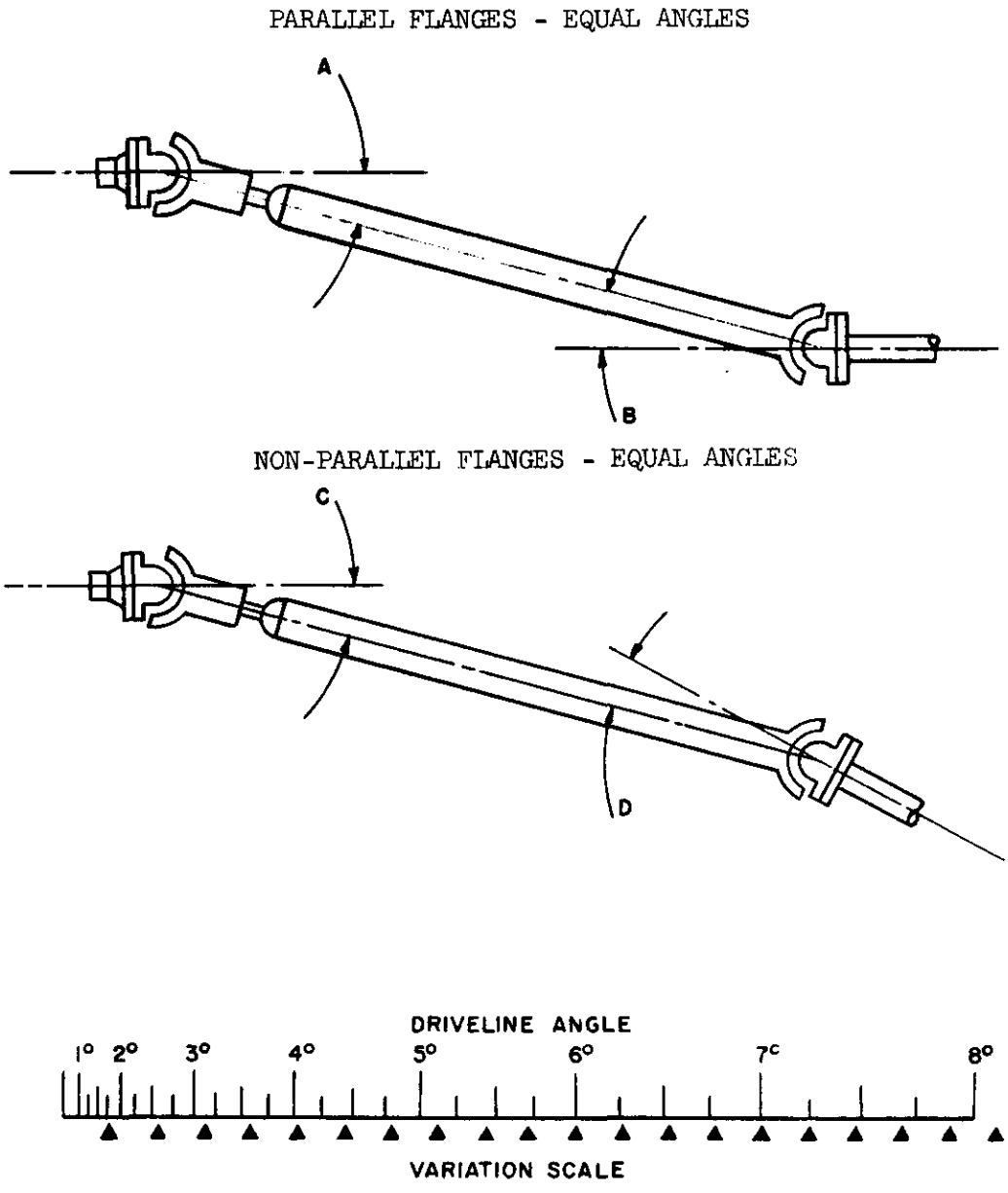
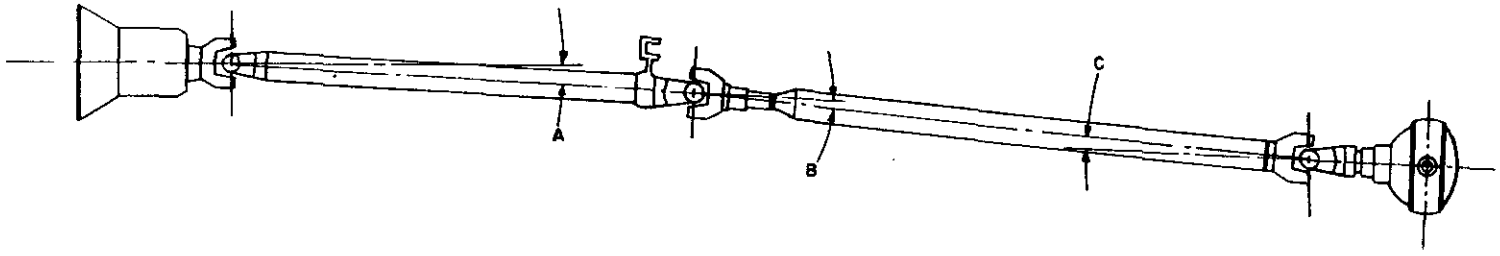


Figure VII-3 Maximum Angle Variation for Two Joint Driveline

PROCEDURE FOR THREE JOINT INSTALLATION (YOKE LUGS ALIGNED AS SHOWN)

1. Locate joint angles "A" and "C" on chart and connect with straight line.
2. Intersection of line is ideal joint angle "B".
3. Suggest maximum deviation from ideal angle "B", ± three increments on Variation Scale "b".

Illustrated is a three joint assembly having angle "A" = 2°, angle "C" = 4°, and ideal angle "B" = 4°30'. Suggested maximum limit for angle "B" would be 3°15' to 5°30'.



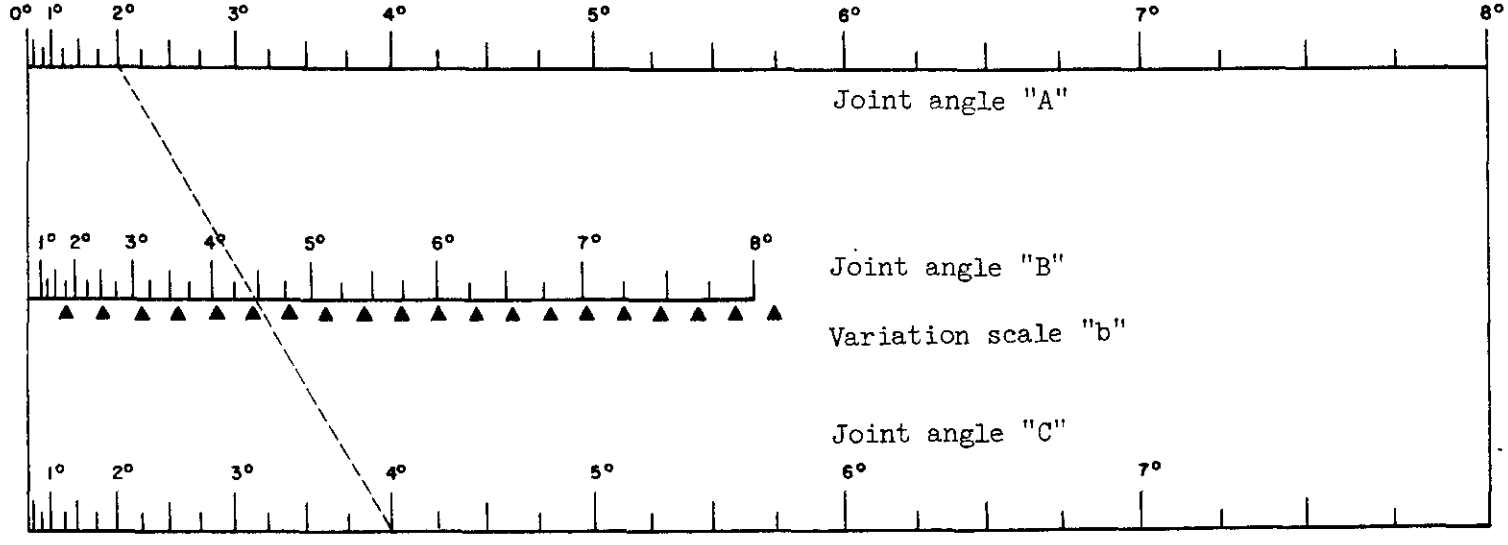
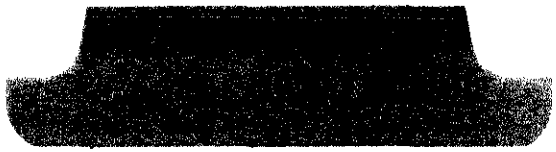


Figure VII-4 Relationship of Angles for Three Joint Driveline



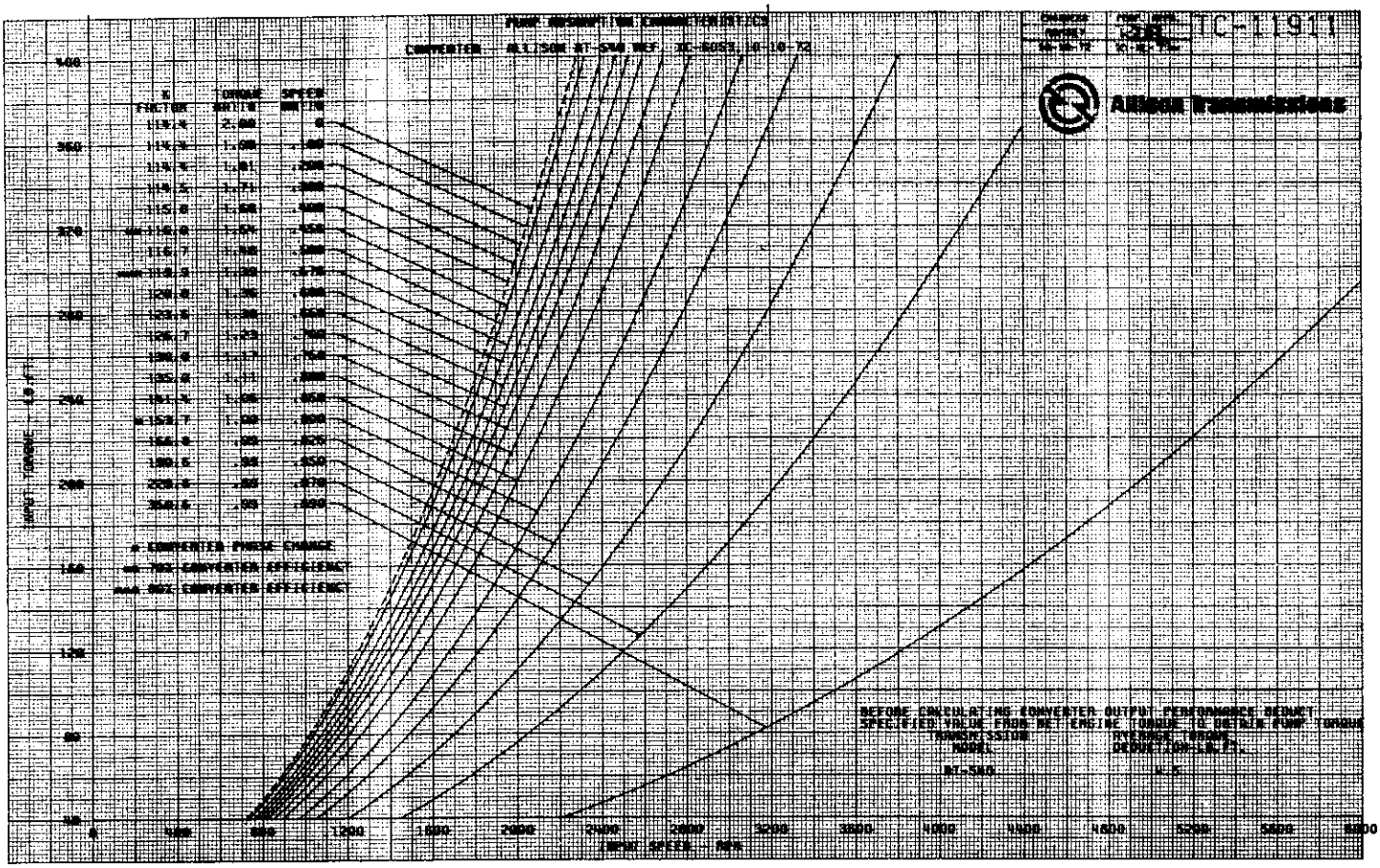
INDEX OF MATCH CHARTS
ON AND OFF-HIGHWAY TRANSMISSION PRODUCTS

ON-HIGHWAY	OFF-HIGHWAY	MODEL	ELEMENTS	APPLICATION	SA NUMBER
X		AT-540	3	AT-540	1367
	X	TC-350	3	TC-350, CRT-3000	1173A
X		TC-350	3	MT-643, 653DR	1368
	X	TC-360	3	CRT-3000	1174A
	X	TC-370	3	TC-370, CRT-3000	1175A
X		TC-370	3	MT-643, 653DR	1369
X		TC-370	3	AT-543	1595
X		TC-380	3	MT-643, 653DR	1473A
	X	TC-405	3	CLT-654	1540
	X	TC-420	4	CLT3000	1193
	X	TC-430	4	CLT-3000	1194
X	X	TC-430	3	TC-430, CLBT-4460, HT-70	1176A
X	X	TC-450	3	TC-450, CLBT-4460, HT-70	1177A
X	X	TC-470	3	TC-470, CLBT-750, CLBT-4460, HT-70, V-730, HT-740D, HT-750CRD, HT-750DRD	1178C
X	X	TC-490	3	CLBT-750, CLBT-4460, HT-70, V-730	1179A
X		TC-494	3	MT-644	1541
X	X	TC-495	3	MT-644, 654CR, CLBT-750DB, CLBT-4460, HT-70	1342
X	X	TC-497	3	MT-654CR, CLBT-750, HT-740FS, HT-750CRD, HT-750DRD, HT-740D	1542
X	X	TC-498	3	CLBT-750, HT-740D, HT-740FS, HT-750CRD	1543
X	X	TC-499	3	CLBT-750DB, HT-750DRD	1370A
	X	VTC-430	3	VCLT-3000	1205
	X	VTC-490	3	VCLT-4000	1206
	X	VTC-497	3	VCLT-750	1600
	X	TC-530	3	TC-530, CRT-5000, CLBT-5860	1198
	X	TC-540	3	TC-540, CRT-5000, CLBT-5860	1199
	X	TC-550	3	TC-550, CRT-5000, CLBT-5860	1200
	X	TC-560	3	TC-560, CRT-5000, CLBT-5860	1201
	X	TC-570	3	TC-570, CRT-5000, CLBT-5860	1202
	X	TC-580	3	TC-580, CRT-5000, CLBT-5860	1203
	X	TC-590	3	CRT-5000, CLBT-5860	1204
	X	VTC-550	3	VCLT-5860	1596
	X	VTC-570	3	VCLT-5860	1597

INDEX OF MATCH CHARTS - ON AND OFF-HIGHWAY TRANSMISSION PRODUCTS

ON-HIGHWAY	OFF-HIGHWAY	MODEL	ELEMENTS	APPLICATION	SA NUMBER
	X	TC-680	3	CLBT-5960, 6061	1180A
	X	TC-690	3	CLBT-5960, 6061	1181A
	X	VTC-690	3	VCLT-5860, 5960, 6061	1207
	X	TC-840	4	TC-840	1182A
	X	TC-840	3	DP-8000	1240A
	X	TC-850	4	TC-850	1183A
	X	TC-860	3	DP-8000	1343
	X	TC-880	3	DP-8000	1261
	X	TC-890	3	DP-8000	1262
	X	TC-940	4	TC-940	1184A
	X	TC-950	4	TC-950	1185A
	X	TT-220	4	TT-2000	1186A
	X	TT-230	4	TT-2000	1187A
	X	TT-240	4	TT-2000	1188A
	X	TT-250	4	TT-2000	1598
	X	TT-260	4	TT-2000	1189A
	X	TT-270	4	TT-2000	1190A
	X	TT-424	4	TT-2000	1479
	X	TT-425	4	TT-2000, TT-3000, TT-4000	1191B
	X	TT-430	4	TT-4000	1192A
	X	TT-444	4	TT-2000	1599
	X	TT-445	4	TT-2000, TT-3000, TT-4000	1351A
	X	TT-450	4	TT-4000	1258A
	X	TT-465	4	TT-3000, TT-4000	1195B
	X	TT-470	4	TT-4000	1259A
	X	TT-625	4	TT-4000	1196A
	X	TT-645	4	TT-4000	1260
	X	TT-242	4	TT-2000	1344
	X	TT-252	4	TT-2000	1345
	X	TT-262	4	TT-2000	1346
	X	TT-272	4	TT-2000	1347
	X	TT-426	4	TT-2000	1348
	X	TT-427	4	TT-2000	1349
	X	TT-447	4	TT-2000	1350

CONVERTER MATCH CHART MODEL NO. AT-540



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

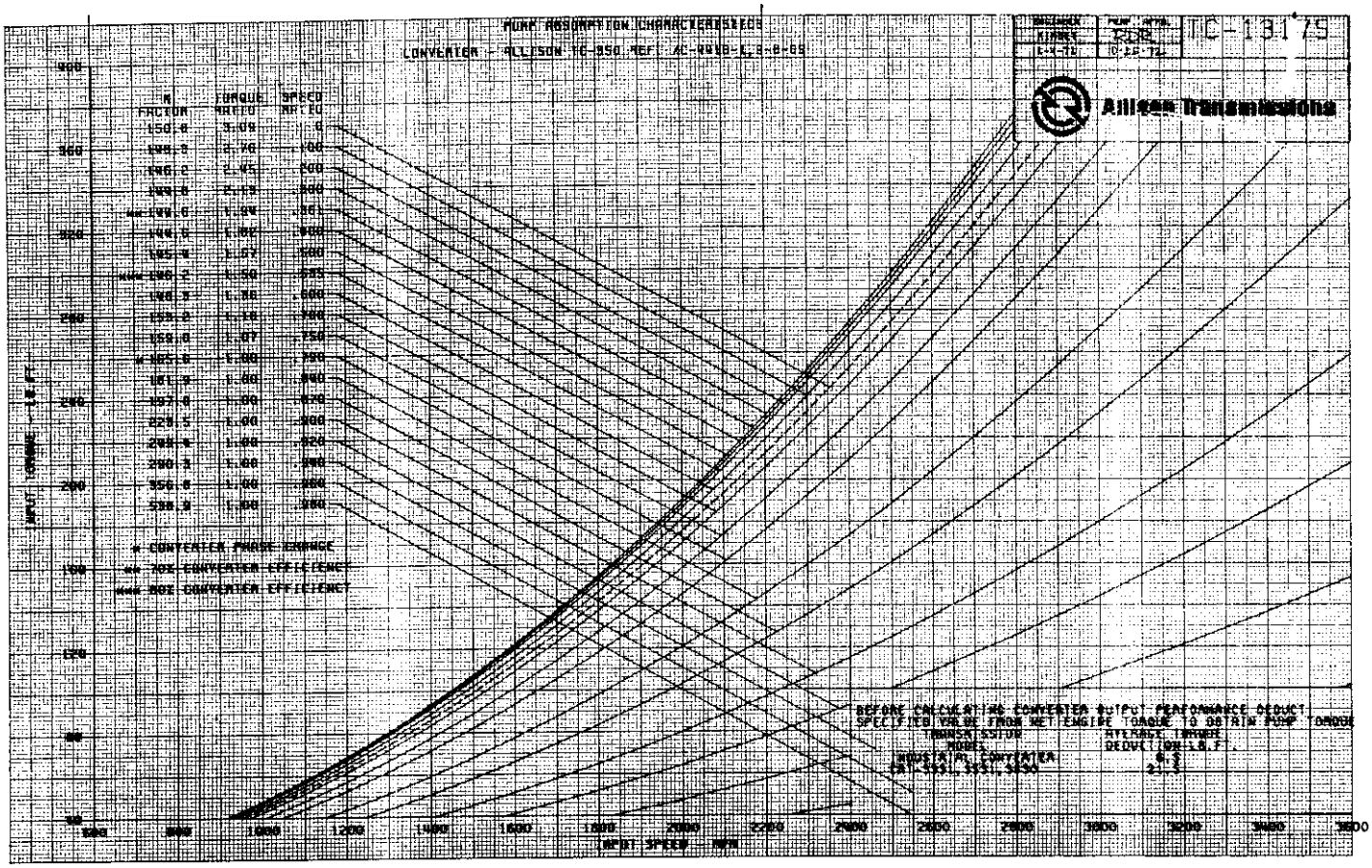
$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	2.00					
0.100	1.90					
0.200	1.81					
0.300	1.71					
0.400	1.60					
0.456	1.54					
0.500	1.48					
0.576	1.39					
0.600	1.36					
0.650	1.30					
0.700	1.23					
0.750	1.17					
0.800	1.11					
0.850	1.06					
0.900	1.00					
0.925	0.99					
0.950	0.99					
0.970	0.99					
0.990	0.99					
*Phase change						
**(70%)						
***(80%)						

SA-1367 4/73

Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

CONVERTER MATCH CHART MODEL NO. TC-350



MATCHING CONVERTER AND ENGINE

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To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	3.09					
0.100	2.76					
0.200	2.45					
0.300	2.13					
**0.361	1.94					
0.400	1.82					
0.500	1.57					
***0.535	1.50					
0.600	1.36					
0.700	1.16					
0.750	1.07					
*0.790	1.00					
0.840	1.00					
0.870	1.00					
0.900	1.00					
0.920	1.00					
0.940	1.00					
0.960	1.00					
0.980	1.00					
*Phase change						
**(70%)						
***(80%)						

Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

SA-1173A 11/72

TORQMATIC CONVERTER • MATCH CHART MODEL TC-540

TORQMATIC CONVERTER MATCH CHART

MATCHING CONVERTER AND ENGINE

The selection of the TORQMATIC converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart on the opposite page shows the absorption characteristics of the TORQMATIC converter model indicated. These characteristics include the necessary corrections for the converter charging pump. When matching with the CRT 5631 transmission, deduct 20 lb ft from the NET engine torque. When matching with the CLT 5860 transmission, deduct 25 lb ft from the NET engine torque.

ENGINE DATA			
Mnfctr.:			
Model:			
Curve No:			
RPM (Engine)	Torque (lb-ft)	Torque (deducted)	Net Torque

ENGINE CONVERTER MATCH CHART						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower E x F / 5252
Stall	2.89					
0.10	2.65					
0.20	2.36					
*0.35	1.98					
**0.46	1.74					
0.60	1.44					
0.70	1.25					
0.80	1.06					
***0.85	0.96					
0.90	0.97					
0.925	0.96					
0.95	0.95					
*(70%)						
**(80%)						
***Coupling						

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model and curve number.

The column titled "Torque deducted" represents the torque required to drive engine-driven accessories. This torque must be deducted from the gross torque and will result in the figures to be listed under net torque.

The net engine output torque available for input to the converter must be used in plotting engine speed and torque on the torque converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through coupling as shown in the absorption chart.

When plotting the engine input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

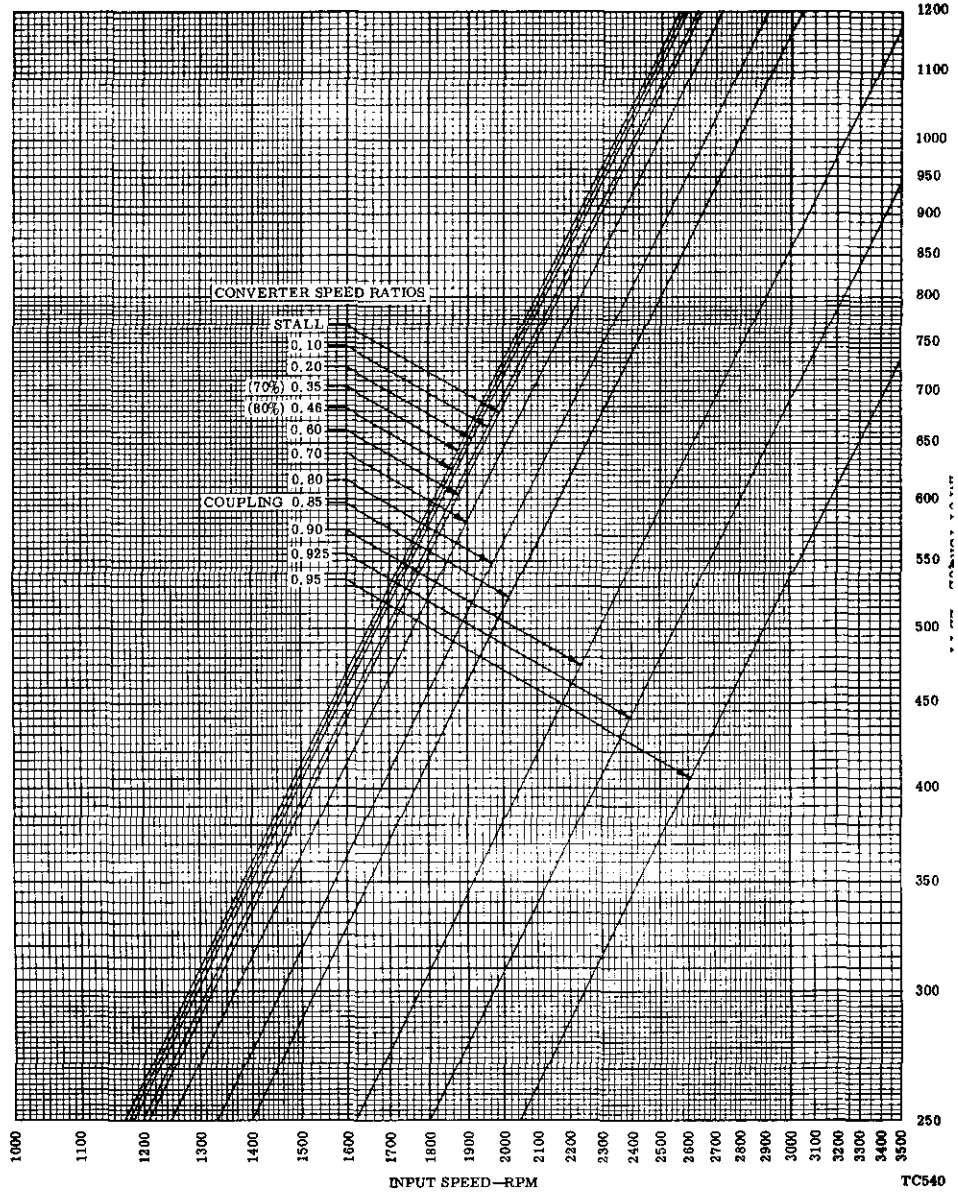
The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart.

For further information contact the Sales Department, Telephone 317-244-1511, Extension 2384

Allison DIVISION OF GENERAL MOTORS, Box 894, Indianapolis, Indiana 46206

TORQMATIC CONVERTER TORQUE ABSORPTION CHART

MODEL TC-540 (3-Element) Converter



SA 1199 1267

Litho U.S.A.

TORQMATIC CONVERTER MATCH CHART MODEL TC-530

TORQMATIC CONVERTER MATCH CHART

MATCHING CONVERTER AND ENGINE

The selection of the TORQMATIC converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart on the opposite page shows the absorption characteristics of the TORQMATIC converter model indicated. These characteristics include the necessary corrections for the converter charging pump. When matching with the CRT 5631 transmission, deduct 20 lb ft from the NET engine torque. When matching with the CLT 5860 transmission, deduct 25 lb ft from the NET engine torque.

ENGINE DATA			
Mnfctr.:			
Model:			
Curve No:			
RPM (Engine)	Torque (lb-ft)	Torque (deducted)	Net Torque

ENGINE CONVERTER MATCH CHART

CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower E x F / 5252
Stall	3.51					
0.10	3.11					
0.20	2.66					
*0.33	2.14					
0.40	1.90					
**0.47	1.70					
0.70	1.19					
***0.80	0.98					
0.85	0.98					
0.90	0.97					
0.925	0.97					
0.95	0.94					
*(70%)						
**(80%)						
***Coupling						

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model and curve number.

The column titled "Torque deducted" represents the torque required to drive engine-driven accessories. This torque must be deducted from the gross torque and will result in the figures to be listed under net torque.

The net engine output torque available for input to the converter must be used in plotting engine speed and torque on the torque converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through coupling as shown in the absorption chart.

When plotting the engine input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart.

For further information contact the Sales Department, Telephone 317-244-1511, Extension 2384

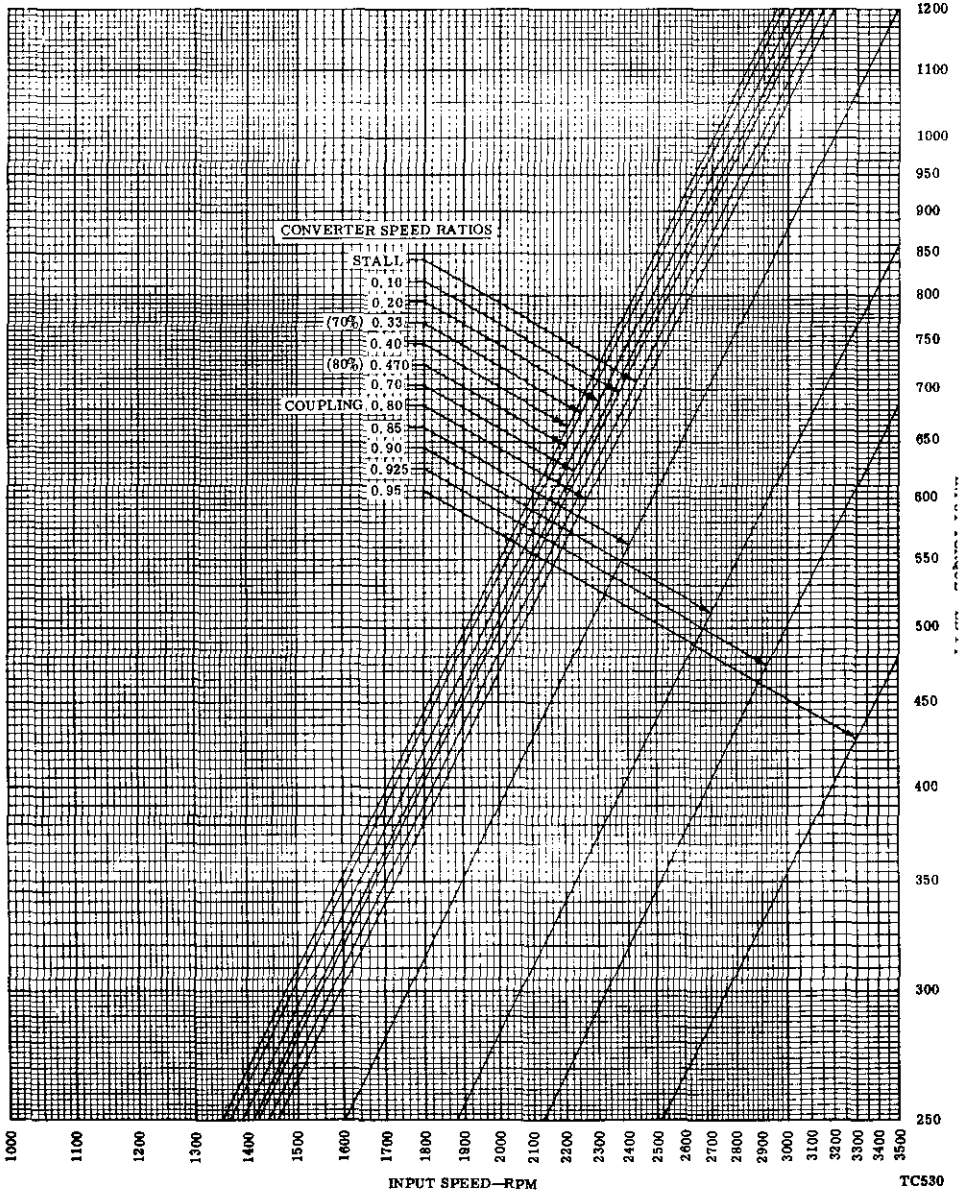
Allison DIVISION OF GENERAL MOTORS, Box 894, Indianapolis, Indiana 46206

SA 1198 1267

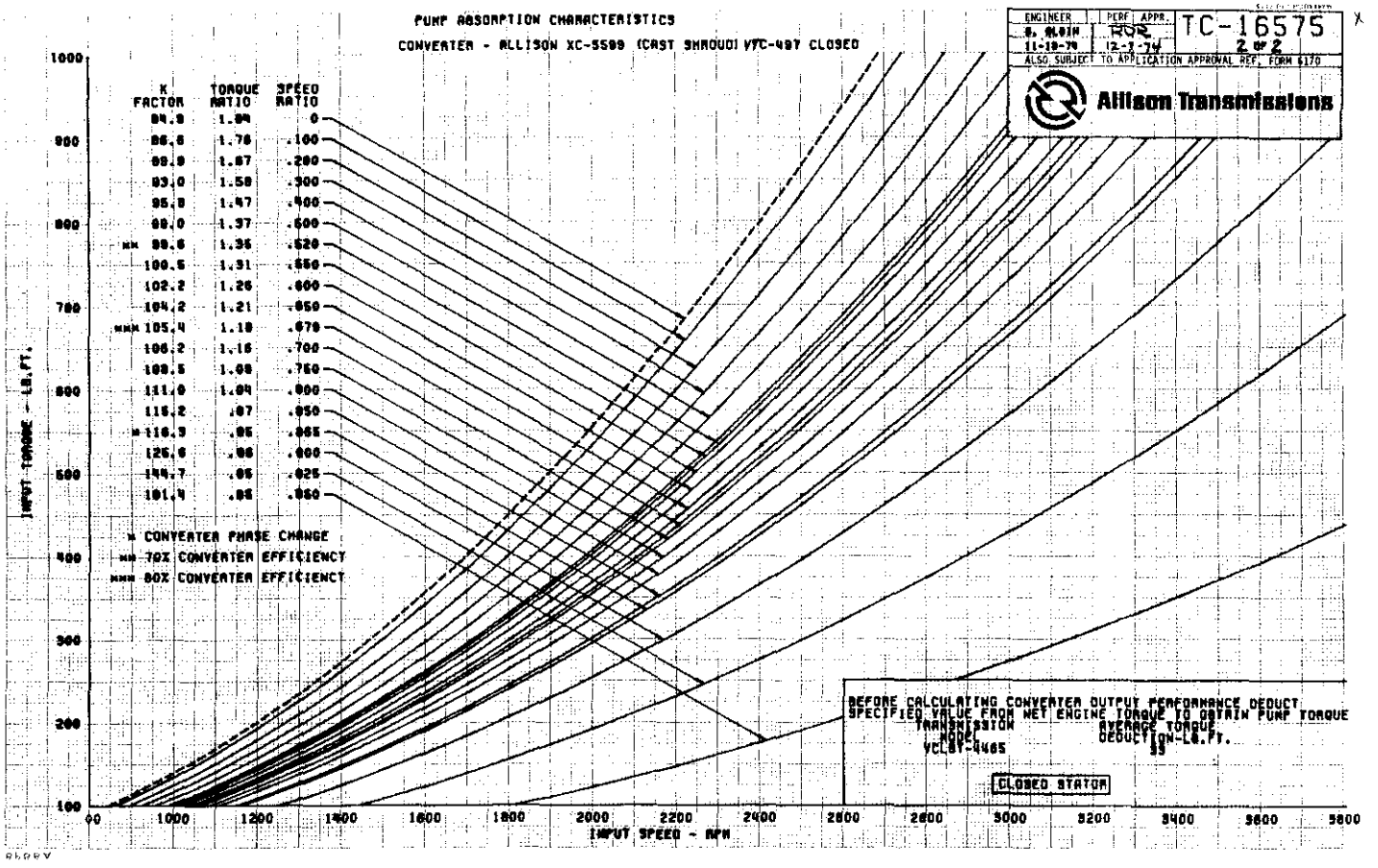
Litho U.S.A.

TORQMATIC CONVERTER TORQUE ABSORPTION CHART

MODEL TC-530 (3-Element) Converter



CONVERTER MATCH CHART MODEL NO. VTC-497



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower E x F / 5252
0	1.84					
0.100	1.76					
0.200	1.67					
0.300	1.58					
0.400	1.47					
0.500	1.37					
**0.520	1.35					
0.550	1.31					
0.600	1.26					
0.650	1.21					
***0.679	1.18					
0.700	1.16					
0.750	1.09					
0.800	1.04					
0.850	0.97					
*0.865	0.95					
0.900	0.96					
0.925	0.95					
0.950	0.95					
*Phase change						
**(70%)						
***(80%)						

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Detroit Diesel Allison
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TORQMATIC CONVERTER MATCH CHART

TORQMATIC CONVERTER MODEL VTC-490 MATCH CHART

MATCHING CONVERTER AND ENGINE

The selection of the TORQMATIC Converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range. In the variable capacity converter (VIP) there are two such ranges, open stator vanes (high converter capacity) and closed stator vanes (low converter capacity). The absorption chart (opposite page) shows the two speed bands (ranges). The match data chart below gives the pertinent data for both the open and closed positions.

The absorption chart on the opposite page shows the dual absorption characteristics of the TORQMATIC model indicated. When matching with the VCLT 4000 series transmissions, deduct 20 lb ft from the net engine torque.

ENGINE DATA			
Mnfctr.:			
Model:			
Curve No:			
RPM (Engine)	Torque (lb-ft)	Torque (deducted)	Net Torque

ENGINE CONVERTER MATCH CHART

CLOSED STATOR VANES							OPEN STATOR VANES						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT			CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) AxC=E	Torque (lb-ft) BxD=F	HP= ExF / 5252	Speed ratic A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) AxC=E	Torque (lb-ft) BxD=F	HP= ExF / 5252
Stall	1.94						Stall	2.35					
0.10	1.83						0.10	2.23					
0.20	1.72						0.20	2.08					
0.30	1.59						0.30	1.91					
0.40	1.47						*0.425	1.65					
*0.535	1.31						0.50	1.51					
0.60	1.23						#0.595	1.34					
0.70	1.13						0.70	1.19					
0.80	1.02						0.80	1.05					
0.825	0.98						+0.875	0.94					
0.85	0.95						0.90	0.94					
0.875	0.91						0.925	0.94					
*(70%)							*(70%) #(80%) +Coupling						

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model and curve number.

The column titled "Torque deducted" represents the torque required to drive engine-driven accessories. This torque must be deducted from the gross torque and will result in the figures to be listed under net torque.

The net engine output torque available for input to the converter must be used in plotting engine speed and torque on the torque converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through coupling as shown in the absorption chart.

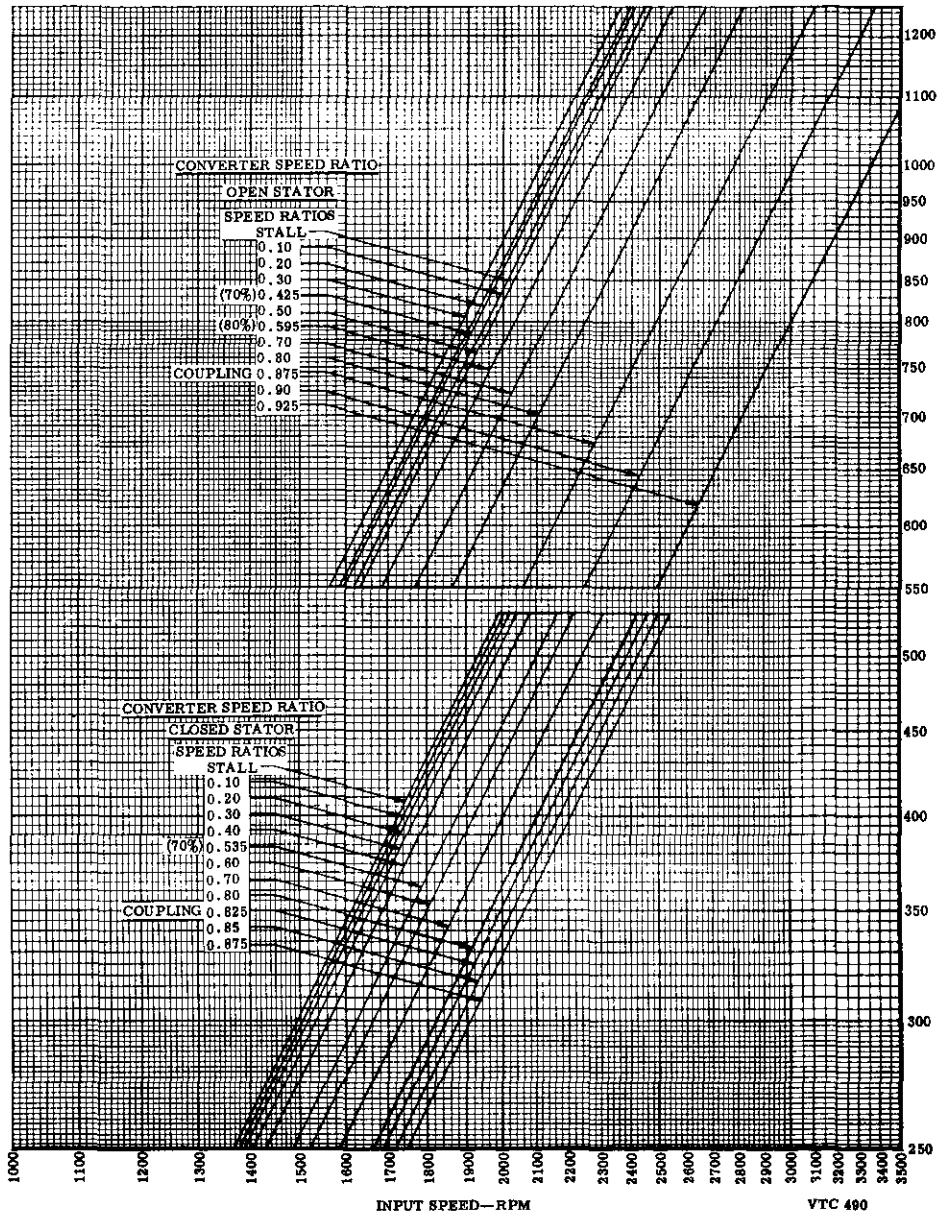
When plotting the engine input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart.

For further information contact the Sales Department, Telephone 317-243-2384

TORQMATIC CONVERTER TORQUE ABSORPTION CHART

MODEL VTC-490 (3-Element) Converter



TORQMATIC CONVERTER MATCH CHART

TORQMATIC CONVERTER MATCH CHART MODEL VTC-430

MATCHING CONVERTER AND ENGINE

The selection of the TORQMATIC Converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range. In the variable capacity converter (VIP) there are two such ranges, open stator vanes (high converter capacity) and closed stator vanes (low converter capacity). The absorption chart (opposite page) shows the two speed bands (ranges). The match data chart below gives the pertinent data for both the open and closed positions.

The absorption chart on the opposite page shows the dual absorption characteristics of the TORQMATIC model indicated. The chart includes the input torque correction for matching with the VCLT 3000 series transmissions.

ENGINE DATA			
Mnfctr.:			
Model:			
Curve No:			
RPM (Engine)	Torque (lb-ft)	Torque (deducted)	Net Torque

ENGINE CONVERTER MATCH CHART

CLOSED STATOR VANES						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) AxC=E	Torque (lb-ft) BxD=F	HP= ExF 5252
Stall	2.50					
0.10	2.26					
0.20	2.03					
0.30	1.81					
0.40	1.60					
*0.48	1.46					
0.60	1.28					
0.70	1.12					
0.80	0.97					
+0.836	0.92					
0.90	0.95					
0.95	0.97					
*(70%) +Coupling						

OPEN STATOR VANES						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratic A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) AxC=E	Torque (lb-ft) BxD=F	HP= ExF 5252
Stall	3.51					
0.10	2.96					
0.20	2.49					
0.30	2.11					
*0.38	1.84					
0.50	1.51					
0.60	1.29					
0.70	1.10					
+0.788	0.94					
0.85	0.96					
0.90	0.95					
0.95	0.91					
*(70%) +Coupling						

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model and curve number.

The column titled "Torque deducted" represents the torque required to drive engine-driven accessories. This torque must be deducted from the gross torque and will result in the figures to be listed under net torque.

The net engine output torque available for input to the converter must be used in plotting engine speed and torque on the torque converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through coupling as shown in the absorption chart.

When plotting the engine input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

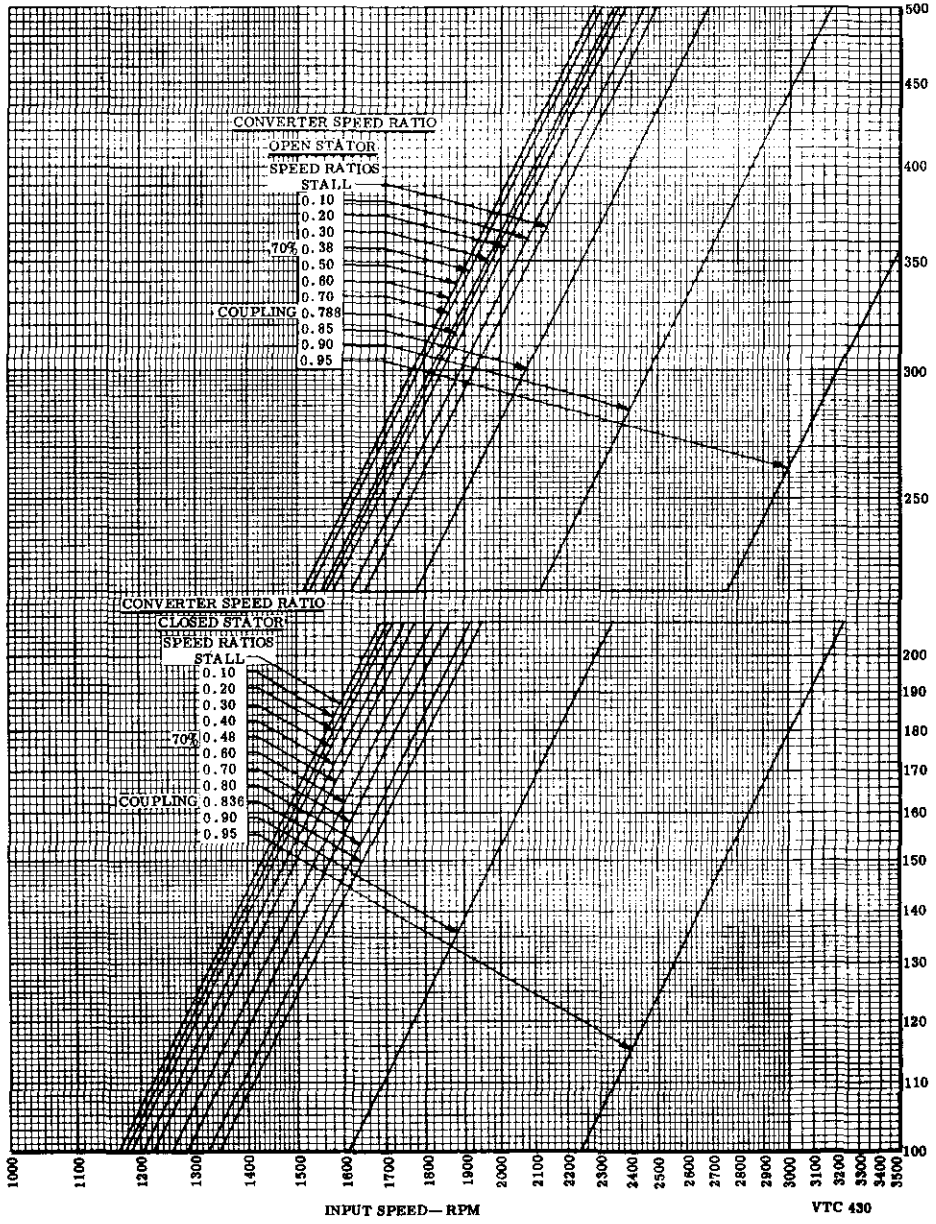
The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart.

For further information contact the Sales Department, Telephone 317-243-2384

Allison DIVISION OF GENERAL MOTORS, Box 894, Indianapolis, Indiana 46206

TORQMATIC CONVERTER TORQUE ABSORPTION CHART

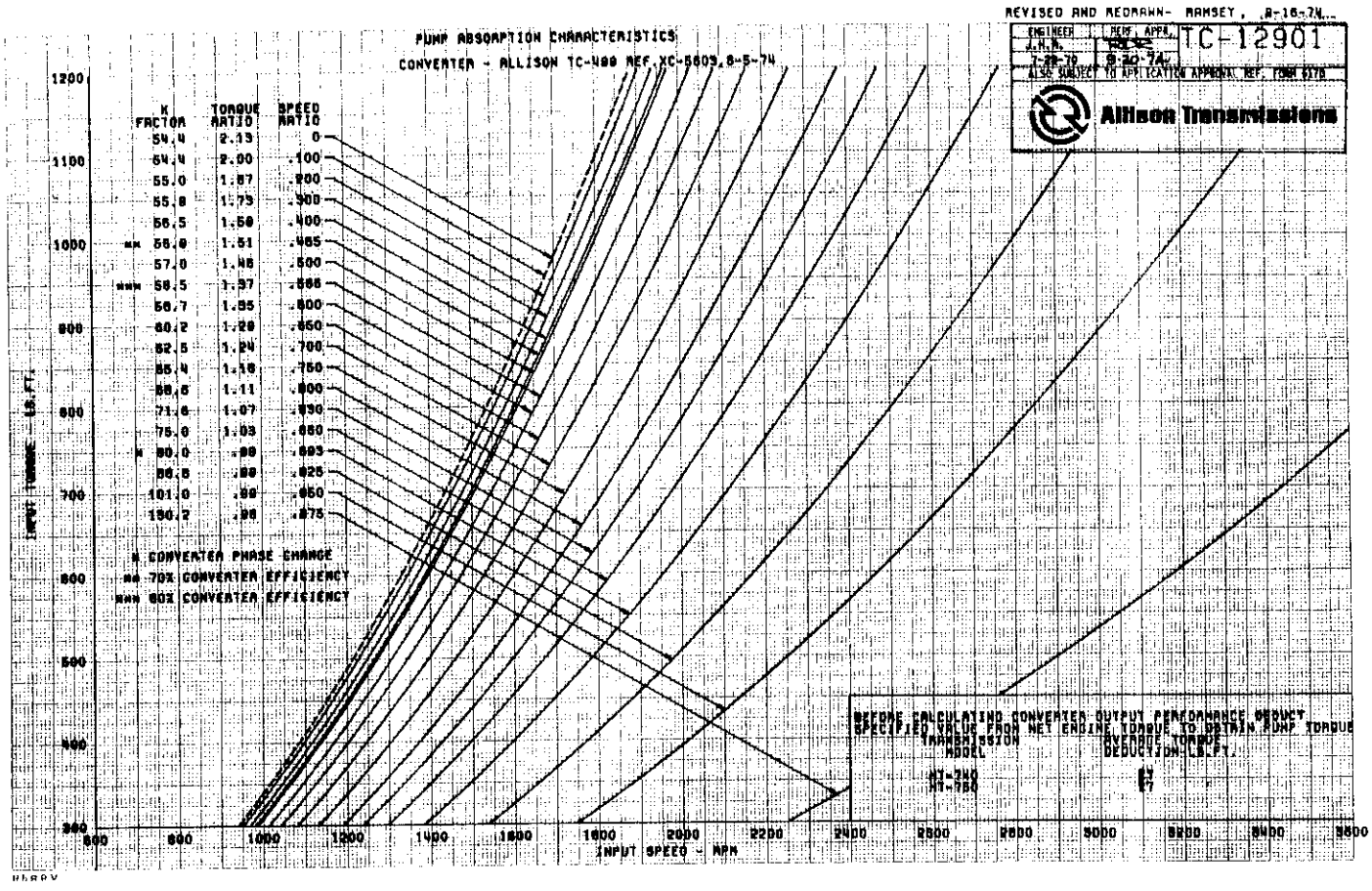
MODEL VTC-430 (3-Element) Converter



SA 1205 768

Litho U.S.A.

CONVERTER MATCH CHART MODEL NO. TC-499



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
0	2.13					
0.100	2.00					
0.200	1.87					
0.300	1.73					
0.400	1.59					
**0.465	1.51					
0.500	1.46					
***0.586	1.37					
0.600	1.35					
0.650	1.29					
0.700	1.24					
0.750	1.18					
0.800	1.11					
0.830	1.07					
0.860	1.03					
*0.893	0.99					
0.925	0.99					
0.950	0.99					
0.975	0.98					
*Phase change						
**(70%)						
***(80%)						

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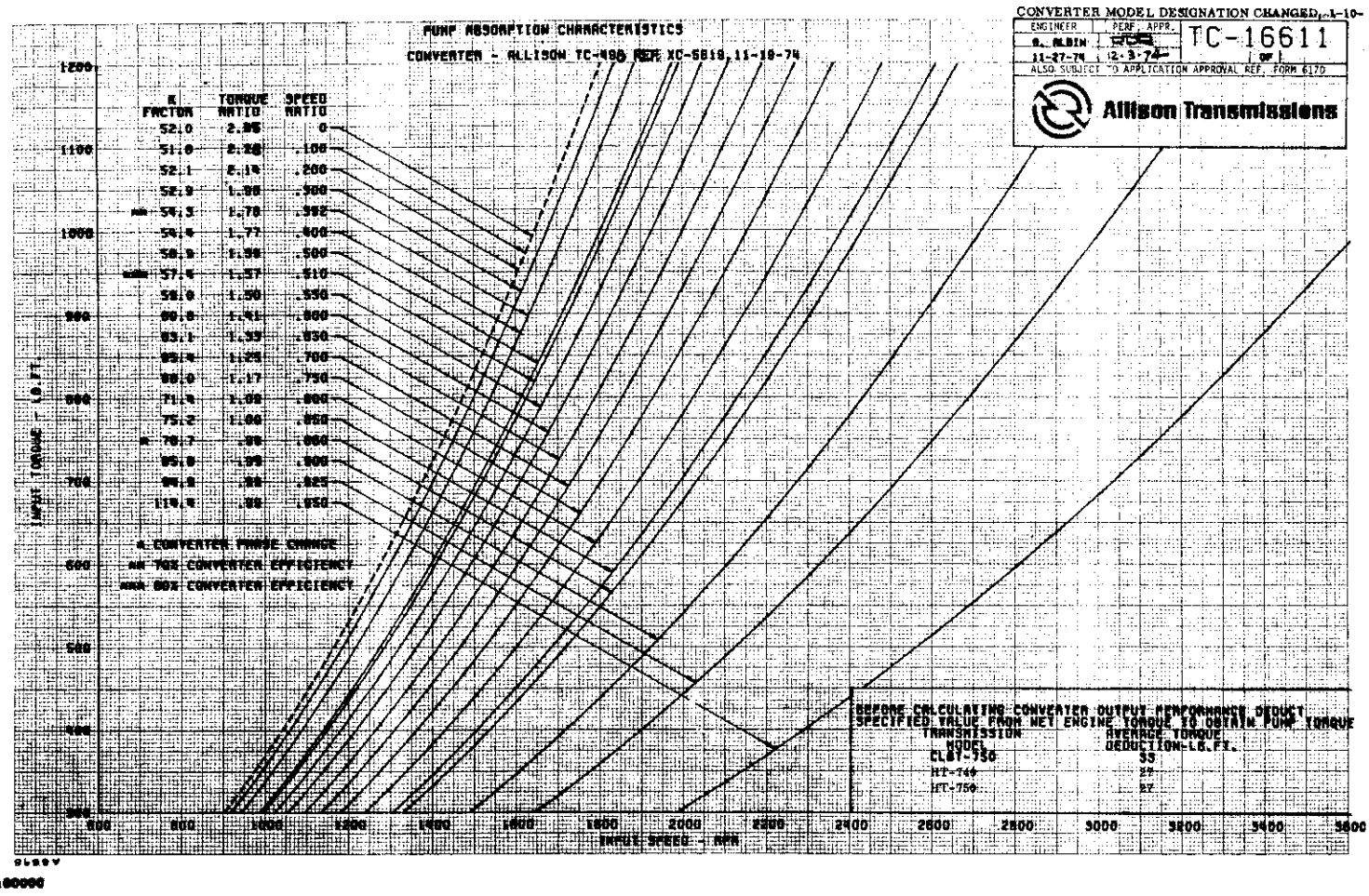
Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

CONVERTER MATCH CHART MODEL NO. TC-498



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

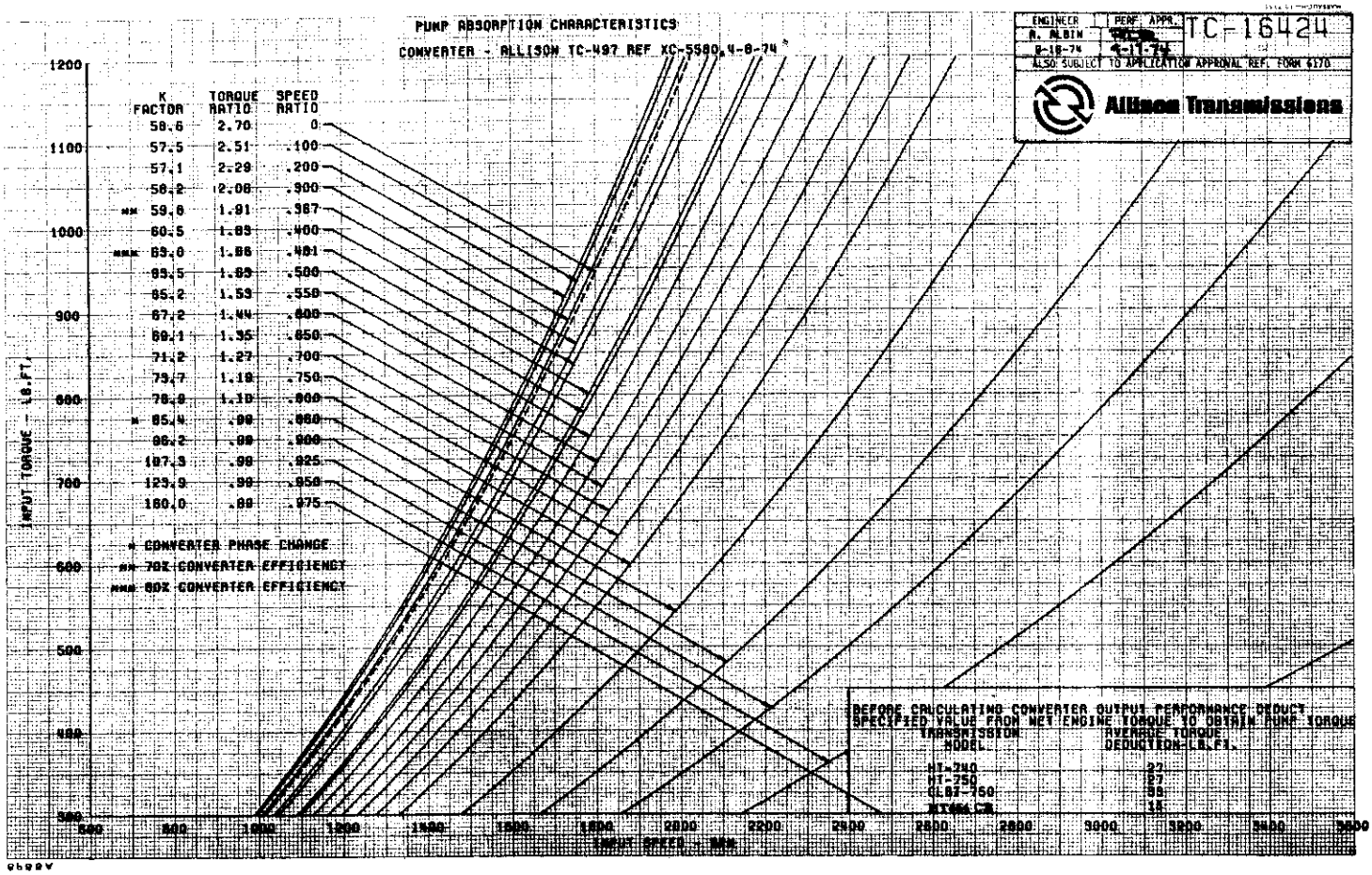
$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower E x F / 5252
Stall	2.35					
0.100	2.28					
0.200	2.14					
0.300	1.96					
**0.392	1.78					
0.400	1.77					
0.500	1.59					
***0.510	1.57					
0.550	1.50					
0.600	1.41					
0.650	1.33					
0.700	1.25					
0.750	1.17					
0.800	1.09					
0.850	1.00					
*0.860	0.99					
0.900	0.99					
0.925	0.99					
0.950	0.99					
*Phase change						
**(70%)						
***(80%)						

SA 1543 6/76

Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

CONVERTER MATCH CHART MODEL NO. TC-497



TC-497

MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

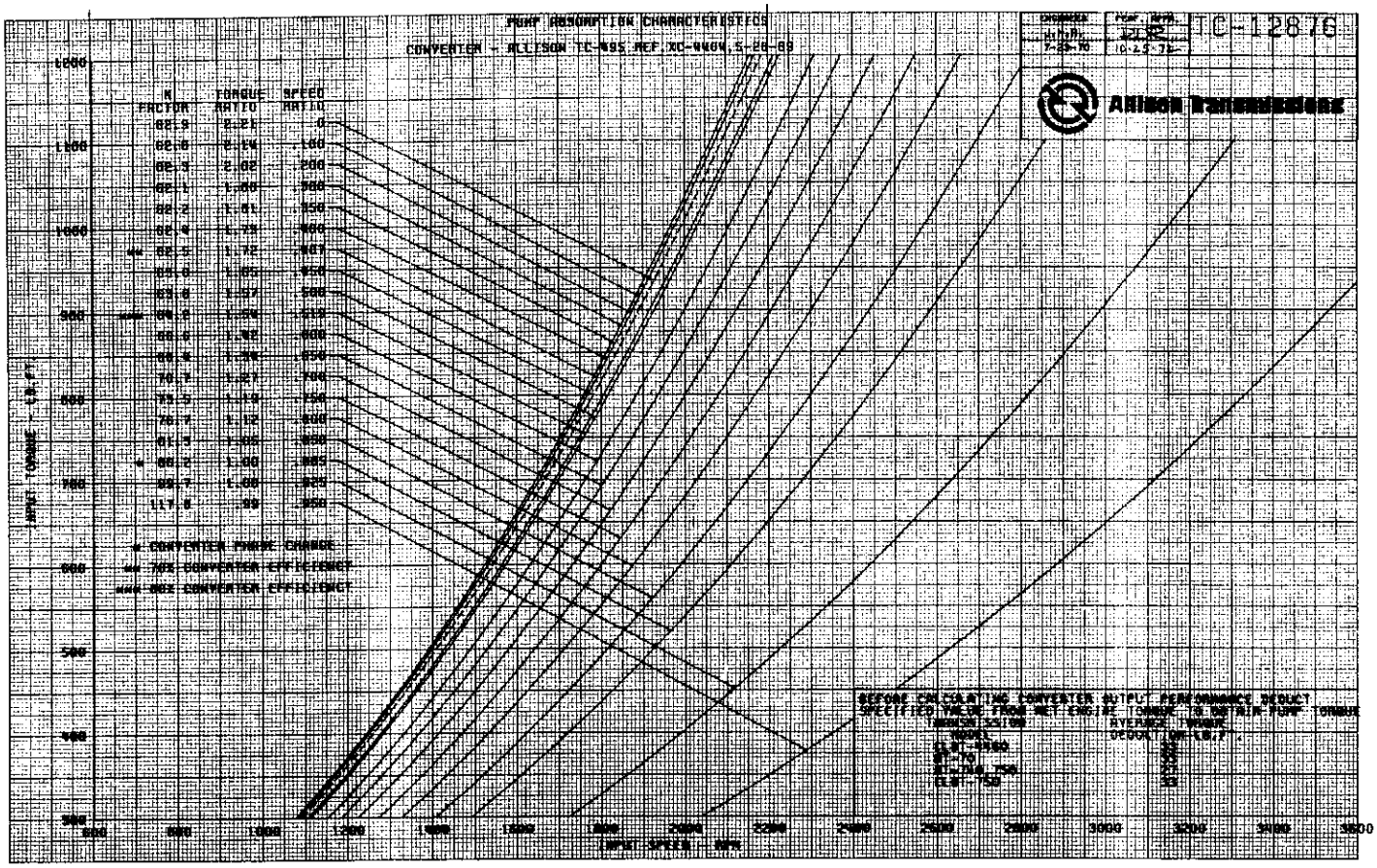
$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower E x F / 5252
Stall	2.70					
0.100	2.51					
0.200	2.29					
0.300	2.06					
**0.367	1.91					
0.400	1.83					
***0.481	1.66					
0.500	1.63					
0.550	1.53					
0.600	1.44					
0.650	1.35					
0.700	1.27					
0.750	1.19					
0.800	1.10					
*0.860	0.99					
0.900	0.99					
0.925	0.99					
0.950	0.99					
0.975	0.99					
*Phase change						
**(70%)						
***(80%)						

SA 1542 6/76

Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

CONVERTER MATCH CHART MODEL NO. TC-495



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	2.21					
0.100	2.14					
0.200	2.02					
0.300	1.88					
0.350	1.81					
0.400	1.73					
**0.407	1.72					
0.450	1.65					
0.500	1.57					
***0.519	1.54					
0.600	1.42					
0.650	1.34					
0.700	1.27					
0.750	1.19					
0.800	1.12					
0.850	1.05					
*0.885	1.00					
0.925	1.00					
0.950	0.99					
*Phase change						
**(70%)						
***(80%)						

Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

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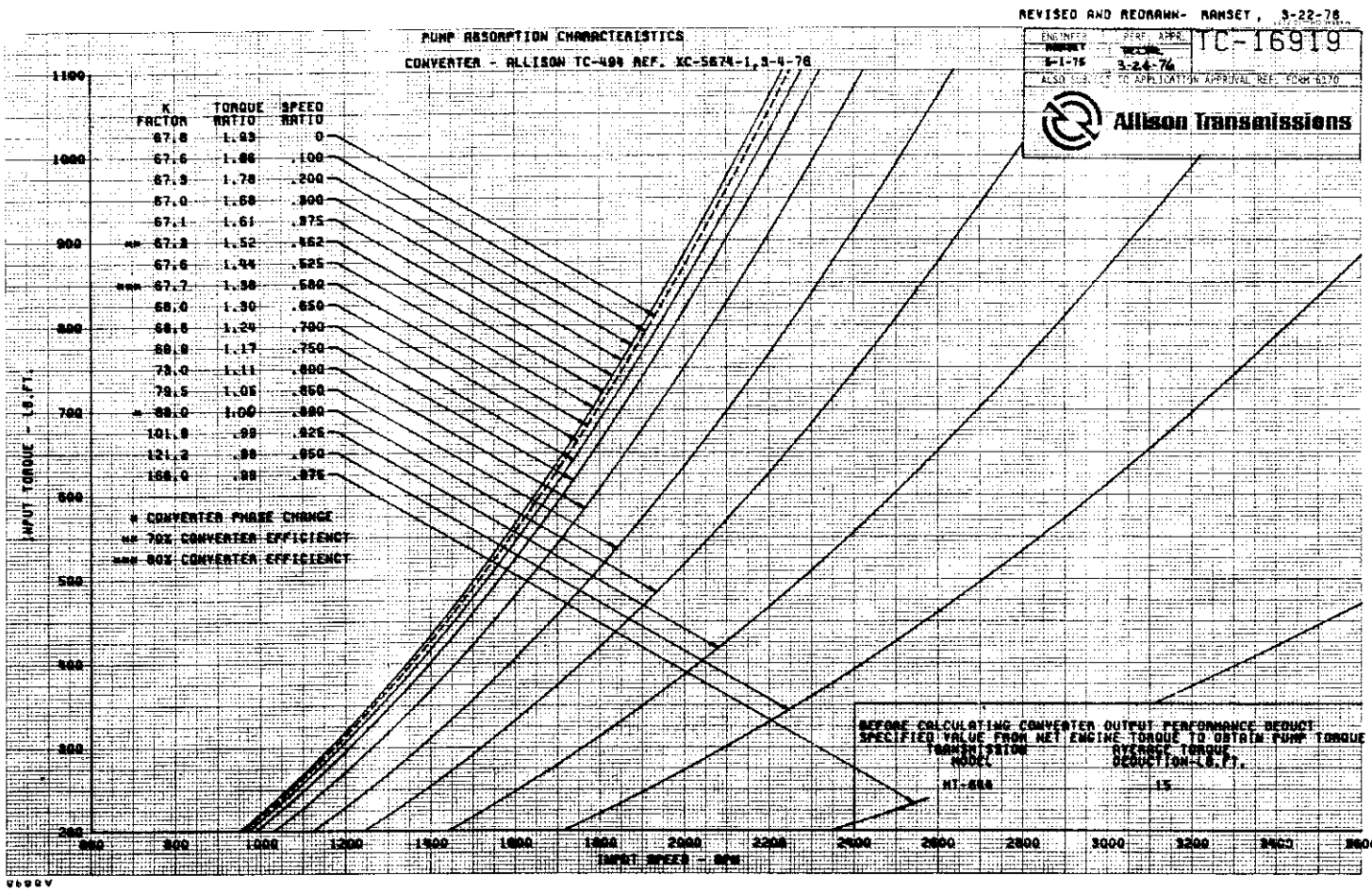
CONVERTER MATCH CHART MODEL NO. TC-494



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	1.93					
0.100	1.86					
0.200	1.78					
0.300	1.68					
0.375	1.61					
**0.462	1.52					
0.525	1.44					
***0.580	1.38					
0.650	1.30					
0.700	1.24					
0.750	1.17					
0.800	1.11					
0.850	1.05					
*0.890	1.00					
0.925	0.99					
0.950	0.99					
0.975	0.99					
*Phase change						
**(70%)						
***(80%)						

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Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

TORQMATIC CONVERTER MATCH CHART MODEL TC-490

TORQMATIC CONVERTER MATCH CHART

MATCHING CONVERTER AND ENGINE

The selection of the TORQMATIC converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart on the opposite page shows the absorption characteristics of the TORQMATIC Converter model indicated. When matching with the CLBT 4460 and HT 70 transmissions, deduct 20 lb ft from the net engine torque.

ENGINE DATA			
Mfgr:			
Model:			
Curve No:			
RPM (engine)	Gross torque	Accessory torque	Net torque

ENGINE-CONVERTER MATCH CHART						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	2.41					
0.100	2.29					
0.200	2.12					
0.300	1.94					
*0.400	1.76					
**0.515	1.55					
0.600	1.41					
0.700	1.25					
0.800	1.08					
***0.862	0.98					
0.900	0.98					
0.925	0.98					
0.950	0.97					
*(70%)						
**(80%)	***Coupling					

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Accessory torque" represents the torque required to drive engine-driven accessories. This torque must be deducted from the gross torque and will result in the figures to be listed under net torque.

The net engine output torque available for input to the converter must be used in plotting engine speed and torque on the torque converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through coupling as shown in the absorption chart.

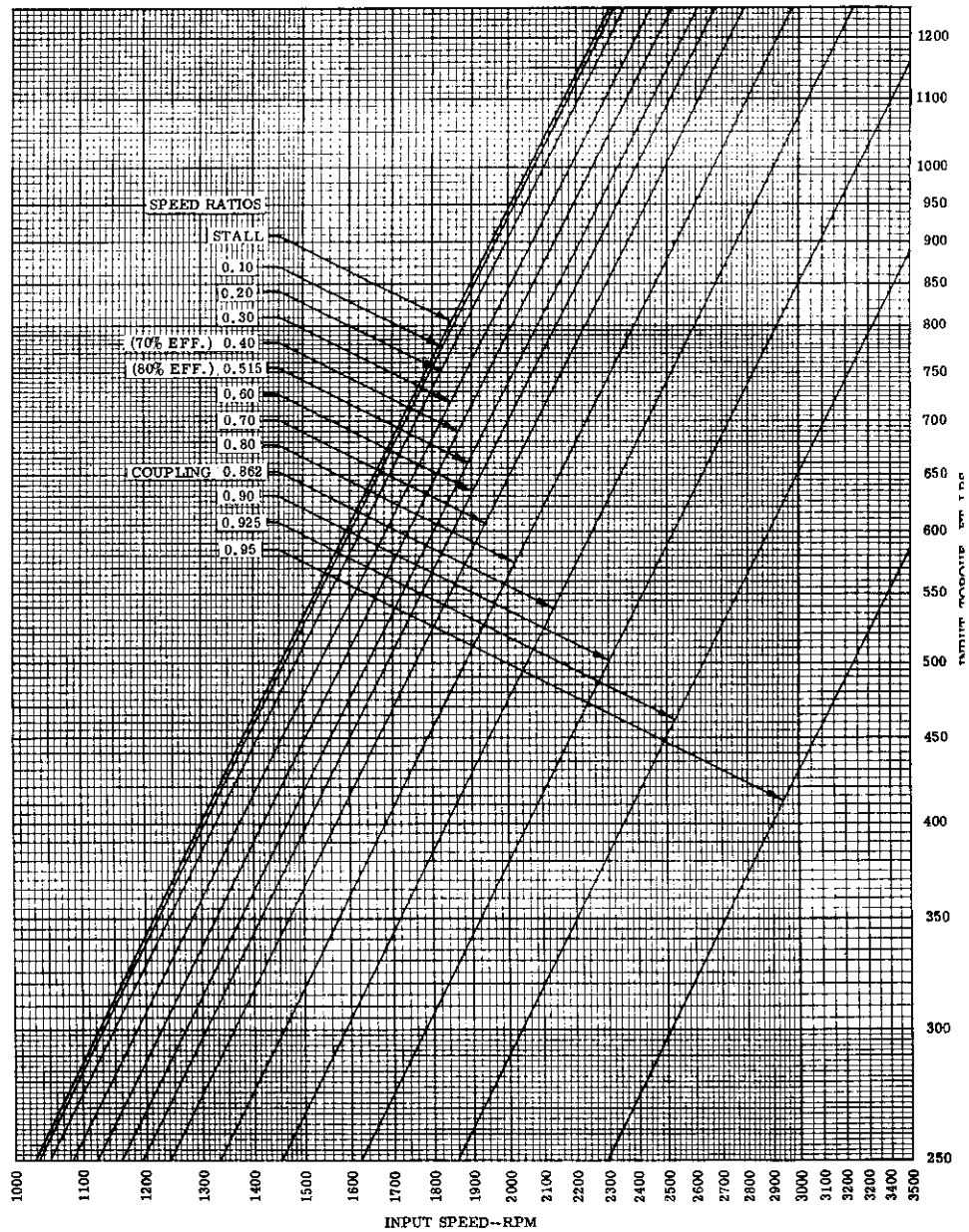
When plotting the engine input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart.

For further information contact the Sales Department

TORQMATIC CONVERTER TORQUE ABSORPTION CHART

Model TC-490 (3-element) Converter



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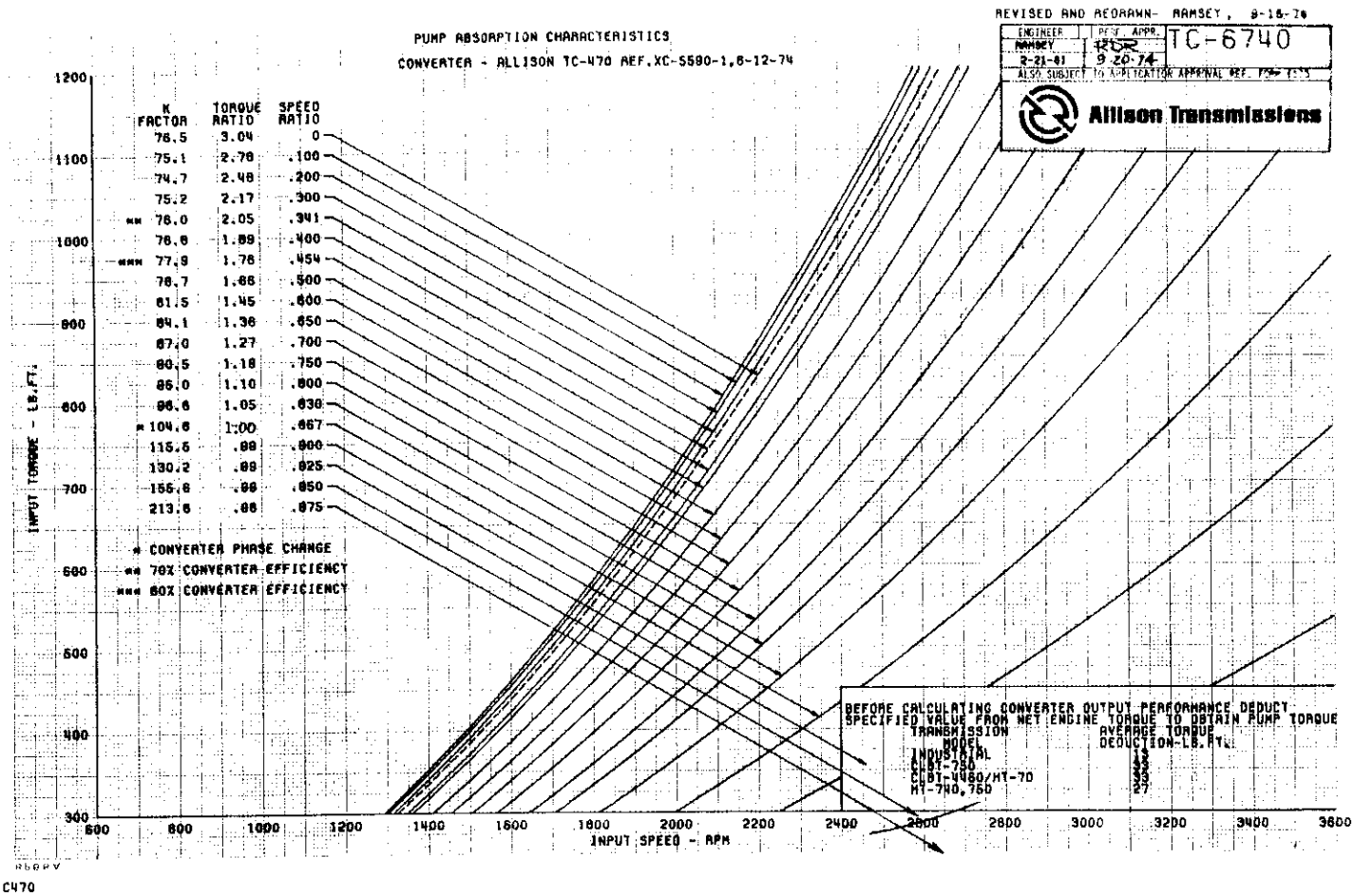
Litho U. S. A.

CONVERTER MATCH CHART MODEL NO. TC-470



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
0	3.04					
0.100	2.78					
0.200	2.48					
0.300	2.17					
**0.341	2.05					
0.400	1.89					
***0.454	1.76					
0.500	1.66					
0.600	1.45					
0.650	1.36					
0.700	1.27					
0.750	1.19					
0.800	1.10					
0.830	1.05					
*0.867	1.00					
0.900	0.99					
0.925	0.99					
0.950	0.99					
0.975	0.98					
*Phase change						
**(70%)						
***(80%)						

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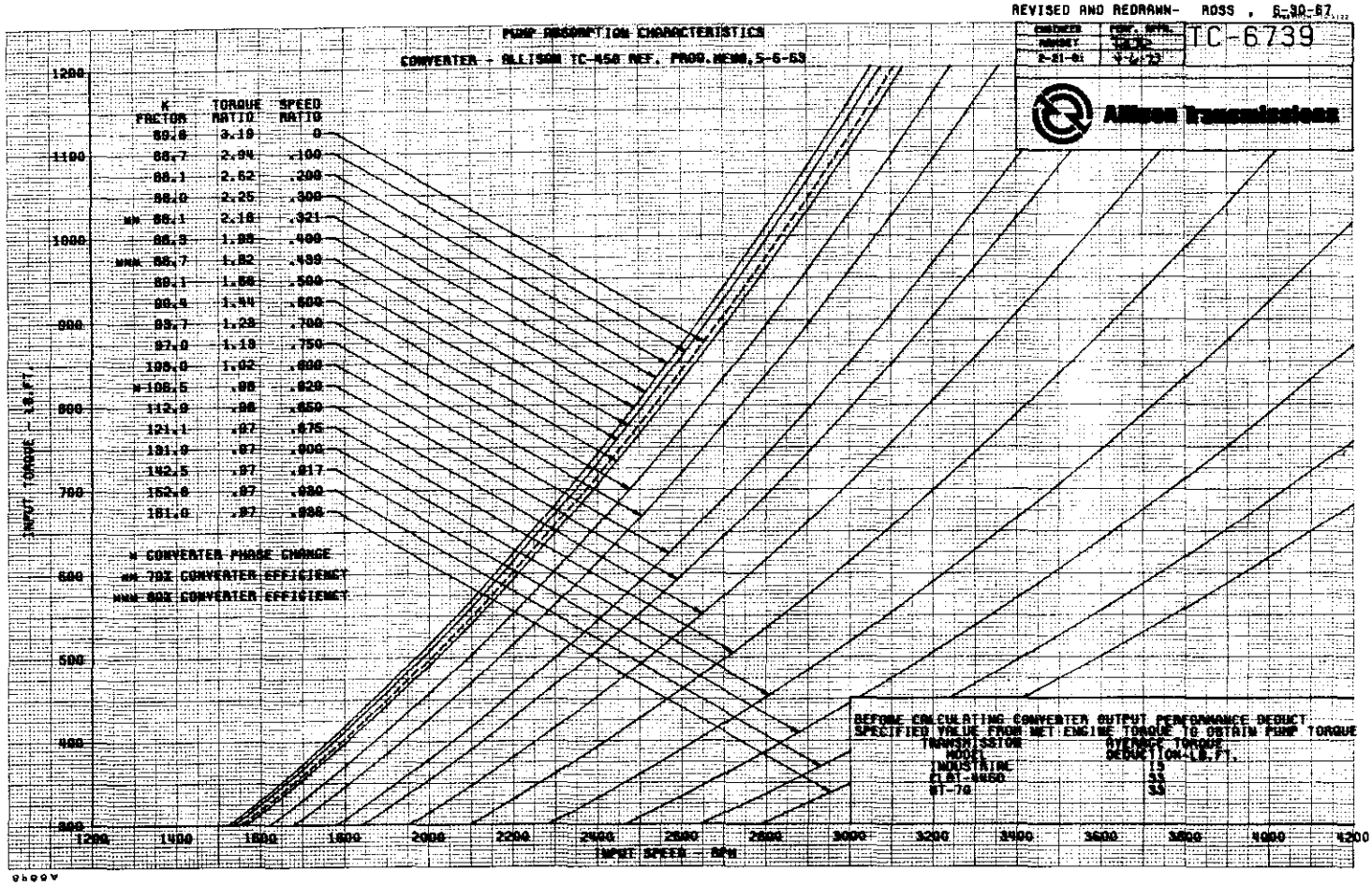
Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

CONVERTER MATCH CHART MODEL NO. TC-450



TC-450

MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	3.19					
0.100	2.94					
0.200	2.62					
0.300	2.25					
0.321	2.18					
0.400	1.93					
0.439	1.82					
0.500	1.66					
0.600	1.44					
0.700	1.23					
0.750	1.13					
0.800	1.02					
0.820	0.98					
0.850	0.98					
0.875	0.97					
0.900	0.97					
0.917	0.97					
0.930	0.97					
0.938	0.97					
*Phase change						
**(70%)						
***(80%)						

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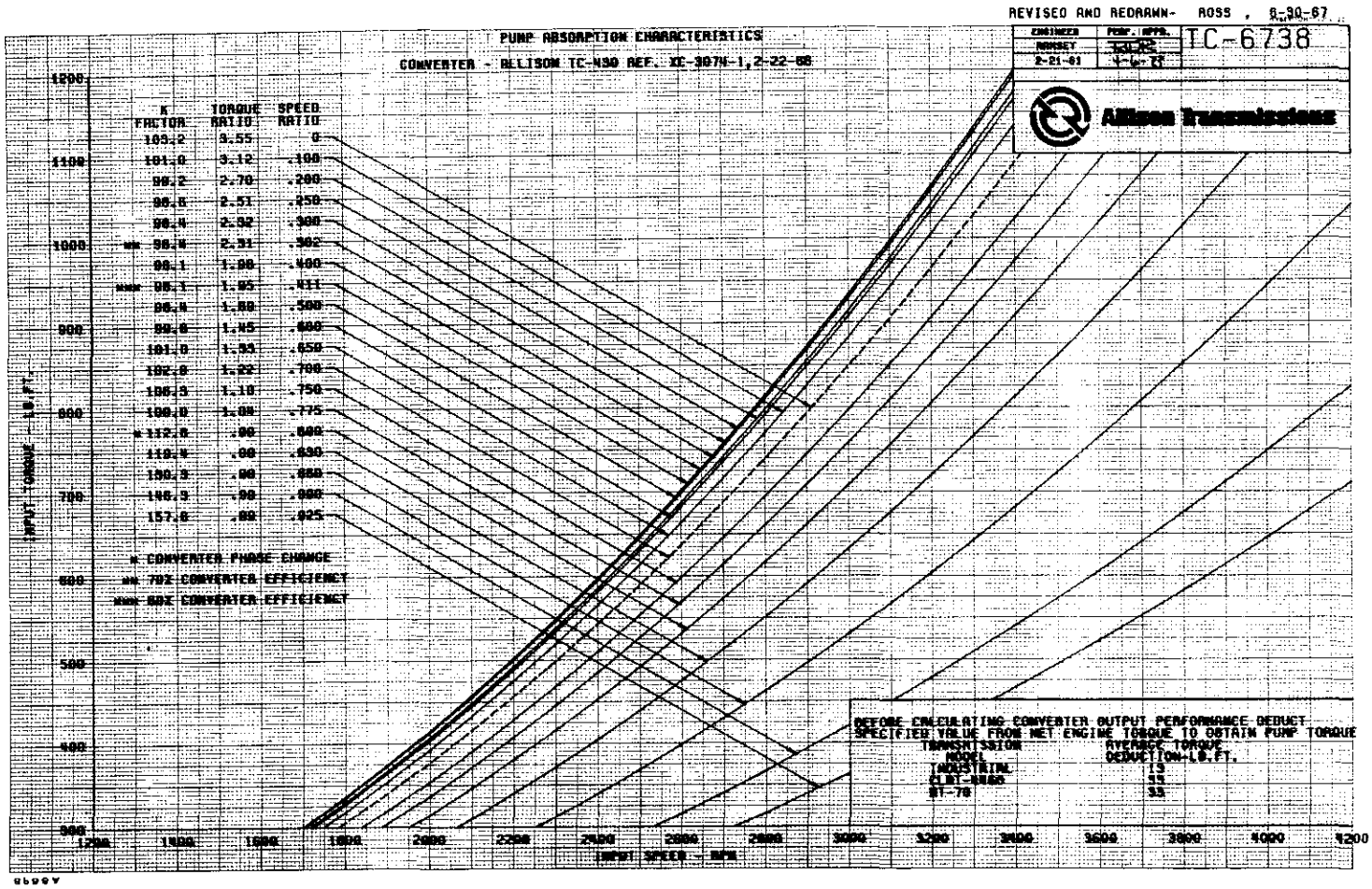
Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

CONVERTER MATCH CHART MODEL NO. TC-430



MATCHING CONVERTER AND ENGINE

The selection of the converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart shown above represents the absorption and performance characteristics of the converter model indicated.

ENGINE DATA			
Mfr:			
Model:			
Curve No:			
ENGINE		CONVERTER	
Speed (rpm)	Net torque (lb-ft)	Torque deduction (lb-ft)	Input torque (lb-ft)

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model, and curve number.

The column titled "Net torque" must represent gross engine torque minus engine accessories (fan, generator, compressor, hydraulic pumps, etc). Input torque to the converter is obtained by subtracting the converter torque deduction (see lower right-hand corner of absorption chart) from the net engine torque.

This input torque in conjunction with engine speed must be plotted on the converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through the phase change as shown in the absorption chart.

When plotting the input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart. In some instances it may be convenient to use the converter K-factor when defining converter capacity characteristics. Each speed ratio line is represented by a single K-factor value where:

$$K = \frac{\text{Input speed (rpm)}}{\sqrt{\text{Input torque (lb ft)}}}.$$

ENGINE-CONVERTER MATCH DATA						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	3.55					
0.100	3.12					
0.200	2.70					
0.250	2.51					
0.300	2.32					
0.302	2.31					
0.400	1.98					
0.411	1.95					
0.500	1.69					
0.600	1.45					
0.650	1.33					
0.700	1.22					
0.750	1.10					
0.775	1.04					
0.800	0.99					
0.830	0.99					
0.860	0.99					
0.900	0.99					
0.925	0.99					
*Phase change						
**(70%)						
***(80%)						

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Detroit Diesel Allison
Division of General Motors Corporation Box 894, Indianapolis, Indiana 46206

TORQMATIC CONVERTER MATCH CHART MODEL TC-43

TORQMATIC CONVERTER MATCH CHART

MATCHING CONVERTER AND ENGINE

The selection of the TORQMATIC converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart on the opposite page shows the absorption characteristics of the TORQMATIC converter model indicated. This converter is applicable to CLT 3341 and 3361 transmissions.

ENGINE DATA			
Mnfctr.:			
Model:			
Curve No:			
RPM (Engine)	Torque (lb-ft)	Torque (deducted)	Net Torque

ENGINE CONVERTER MATCH CHART						
CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower E x F / 5252
Stall	3.51					
0.10	3.05					
0.20	2.60					
*0.34	2.06					
**0.505	1.58					
0.60	1.39					
†0.635	1.32					
‡‡0.70	1.20					
0.80	1.02					
‡‡0.83	0.96					
0.85	0.96					
0.87	0.96					
*(70%)						
**(80%)						
†JUNCTION	‡‡COUPLING					

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model and curve number.

The column titled "Torque deducted" represents the torque required to drive engine-driven accessories. This torque must be deducted from the gross torque and will result in the figures to be listed under net torque.

The net engine output torque available for input to the converter must be used in plotting engine speed and torque on the torque converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through coupling as shown in the absorption chart.

When plotting the engine input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

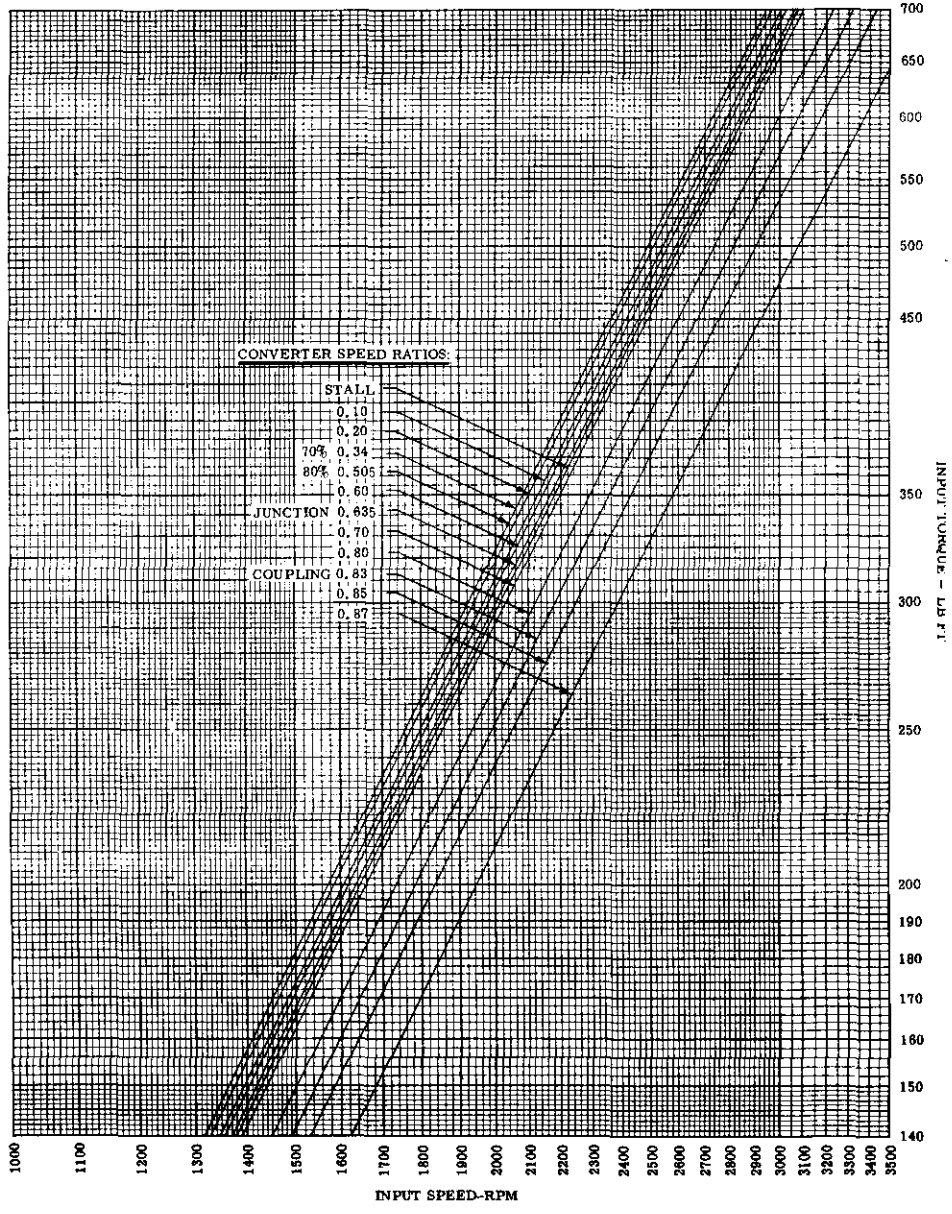
The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart.

For further information contact the Sales Department, Telephone 317-244-1511, Extension 2384

Allison DIVISION OF GENERAL MOTORS, Box 894, Indianapolis, Indiana 46206

TORQMATIC CONVERTER TORQUE ABSORPTION CHART

Model TC-430 (4-element) Converter



SA 1194 1166

Litho U.S.A.

TORQMATIC CONVERTER MATCH CHART MODEL TC-420

TORQMATIC CONVERTER MATCH CHART

MATCHING CONVERTER AND ENGINE

The selection of the TORQMATIC converter model is based not only on engine power characteristics, but also on the type of equipment to be operated and the work cycle.

To get the best overall performance, the maximum horsepower must be obtained in the most used portion of the converter output speed range.

The torque converter absorption chart on the opposite page shows the absorption characteristics of the TORQMATIC converter model indicated. This converter is applicable to CLT 3341, 3361, 3441 and 3461 transmissions.

ENGINE DATA			
Mnfctr.:			
Model:			
Curve No:			
RPM (Engine)	Torque (lb-ft)	Torque (deducted)	Net Torque

ENGINE CONVERTER MATCH CHART

CONVERTER		ENGINE INPUT		CONVERTER OUTPUT		
Speed ratio A	Torque ratio B	Speed (rpm) C	Torque (lb-ft) D	Speed (rpm) A x C = E	Torque (lb-ft) B x D = F	Horsepower $\frac{E \times F}{5252}$
Stall	2.88					
0.10	2.66					
0.20	2.42					
*0.345	2.03					
**0.455	1.76					
0.50	1.65					
‡0.60	1.42					
‡‡0.70	1.21					
0.80	1.02					
0.837	0.94					
0.875	0.94					
0.90	0.94					
*(70%)						
**(80%)						
‡JUNCTION	‡‡COUPLING					

ENGINE DATA

The data covering the engine characteristics to be recorded must include engine make, model and curve number.

The column titled "Torque deducted" represents the torque required to drive engine-driven accessories. This torque must be deducted from the gross torque and will result in the figures to be listed under net torque.

The net engine output torque available for input to the converter must be used in plotting engine speed and torque on the torque converter absorption chart.

CONVERTER INPUT AND OUTPUT CHARACTERISTICS

The converter speed ratios, in relation to engine speed, range from converter turbine stall through coupling as shown in the absorption chart.

When plotting the engine input speed and torque on the absorption chart, the accuracy of the plot is most necessary to obtain a true match.

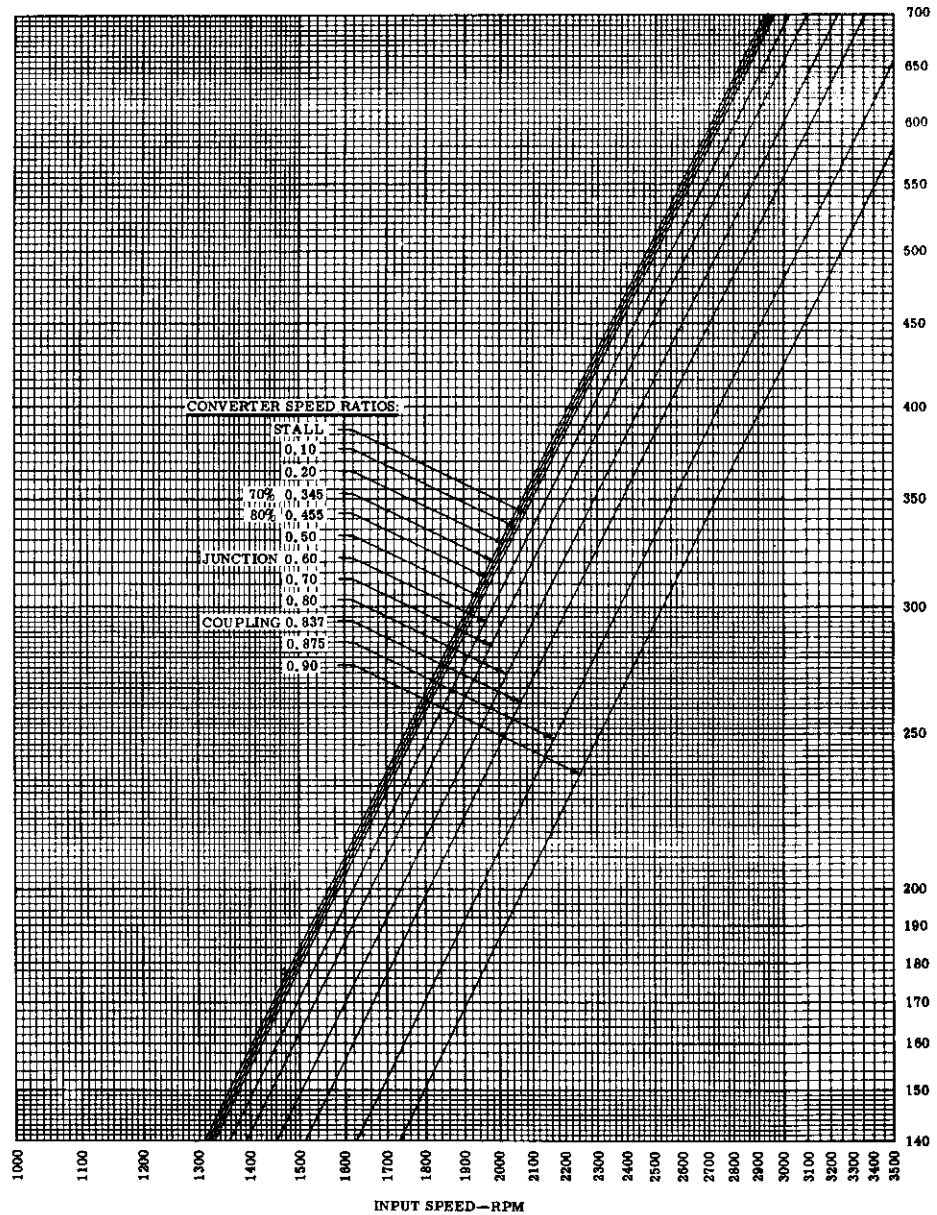
The converter output characteristics can be obtained by compiling the items and steps in the Engine-Converter Match Chart.

For further information contact the Sales Department, Telephone 317-244-1511, Extension 2384

Allison DIVISION OF GENERAL MOTORS, Box 894, Indianapolis, Indiana 46206

TORQMATIC CONVERTER TORQUE ABSORPTION CHART

Model TC-420 (4-element) Converter



SA 1193 1166

Litho U.S.A.