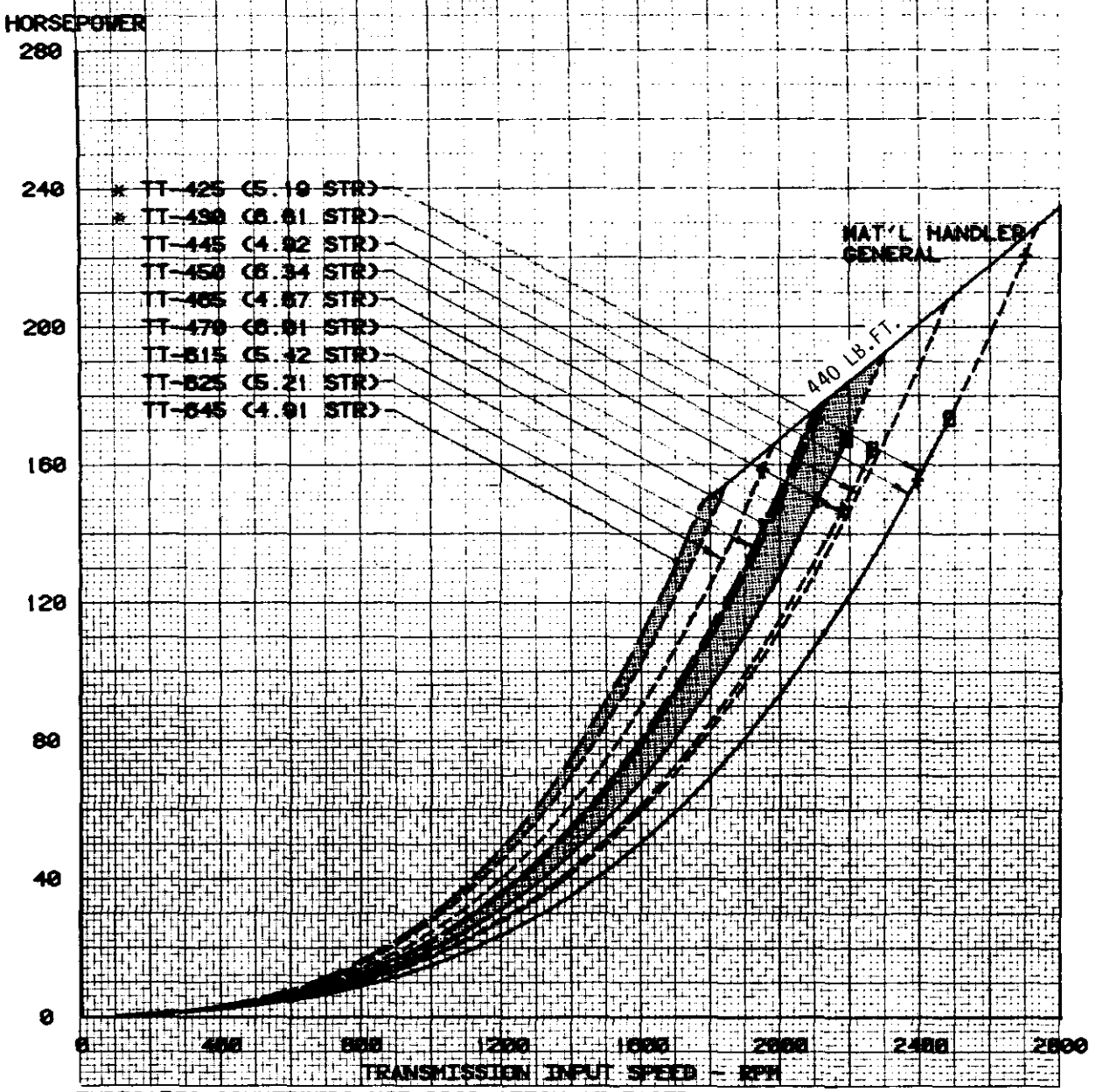
REV. MCAHREN ,02-17-84

ALLISON TRANSMISSION	ENGR	RAMSEY	APPR	DRA	TC-14918
RATING CHART TT-4721		02-23-73		3-5-84	

.848:1 T_2 RATIO

TURBINE TORQUE LIMIT:
⊡ MAT'L HANDLER (2272 LB.FT.)
+ GENERAL (2104 LB.FT.)



* INDICATES CONVERTERS NOT PRODUCTION RELEASED

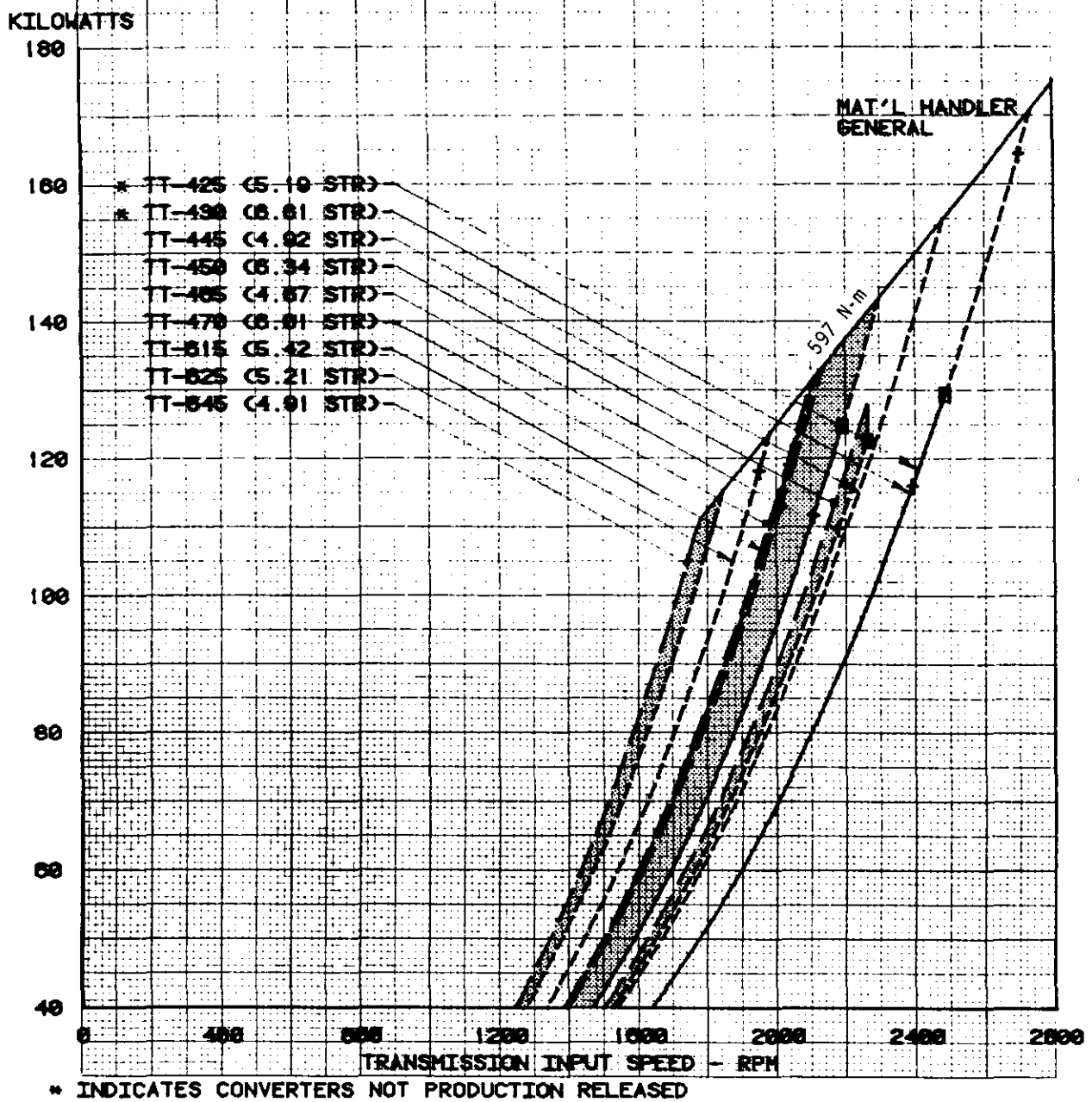
FORM 8362-1(9-82)

REV. MCAHREN ,02-17-84

ALLISON TRANSMISSION	ENGR	RAMSEY	APPR	A.T.A.	TC-14918
RATING CHART TT-4721		02-03-73		3-5-84	

.848:1 T_2 RATIO

TURBINE TORQUE LIMIT:
⊡ MAT'L HANDLER (3080 N-M)
+ GENERAL (2852 N-M)



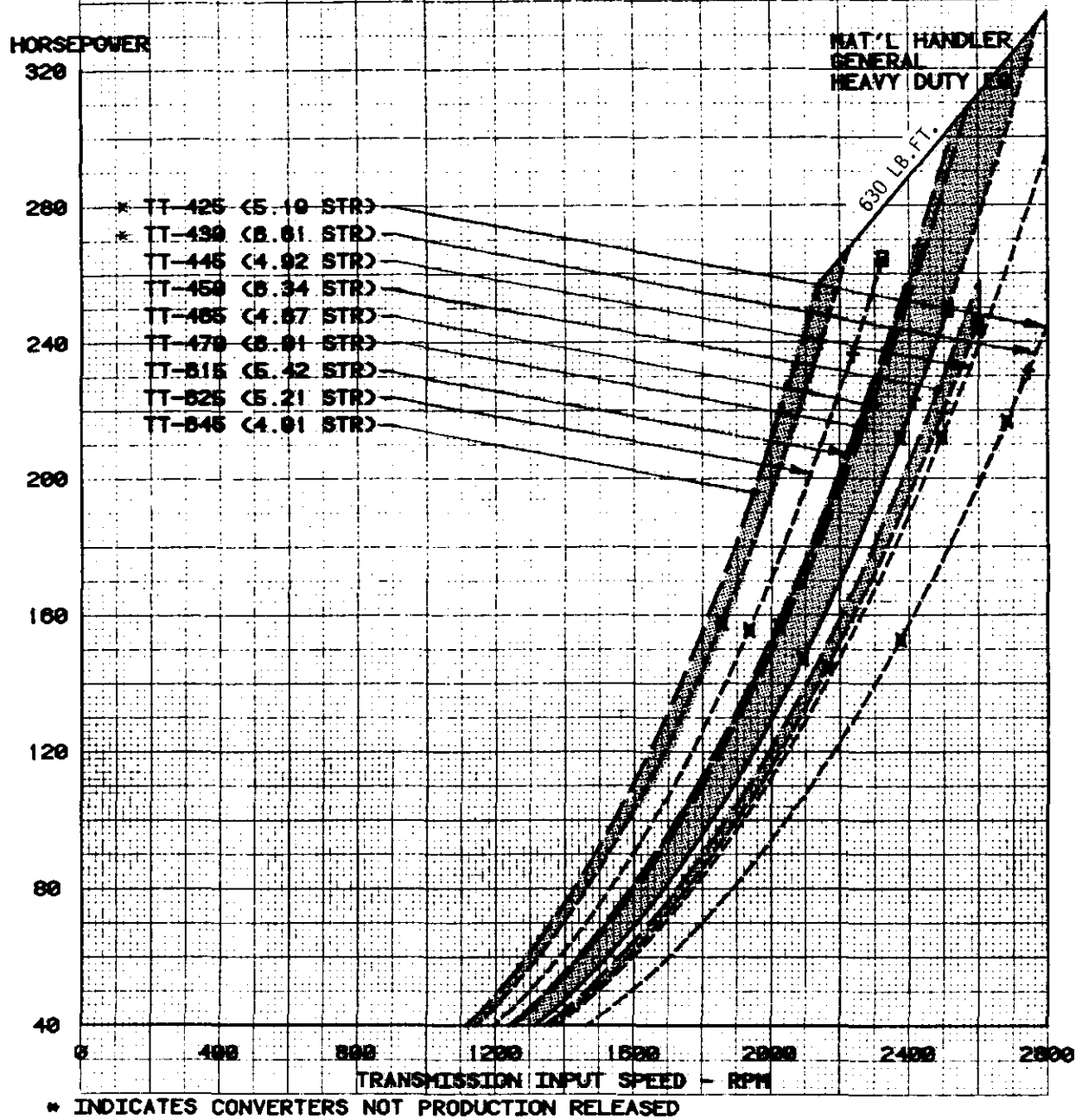
* INDICATES CONVERTERS NOT PRODUCTION RELEASED

REV. MCAHREN ,02-17-84

ALLISON TRANSMISSION	ENGR	RUSSELL	APPR	0.7.A	TC-10058
RATING CHART TRT4621-1	ENGR	11-19-80	APPR	3-5-84	SHEET 1 of 2

.848:1 T_2 RATIO

TURBINE TORQUE LIMIT:
- ⊡ MAT'L HANDLER (2004 LB.FT.)
- \+ GENERAL (2772 LB.FT.)
- ⊠ HEAVY DUTY EQ. (2079 LB.FT.)



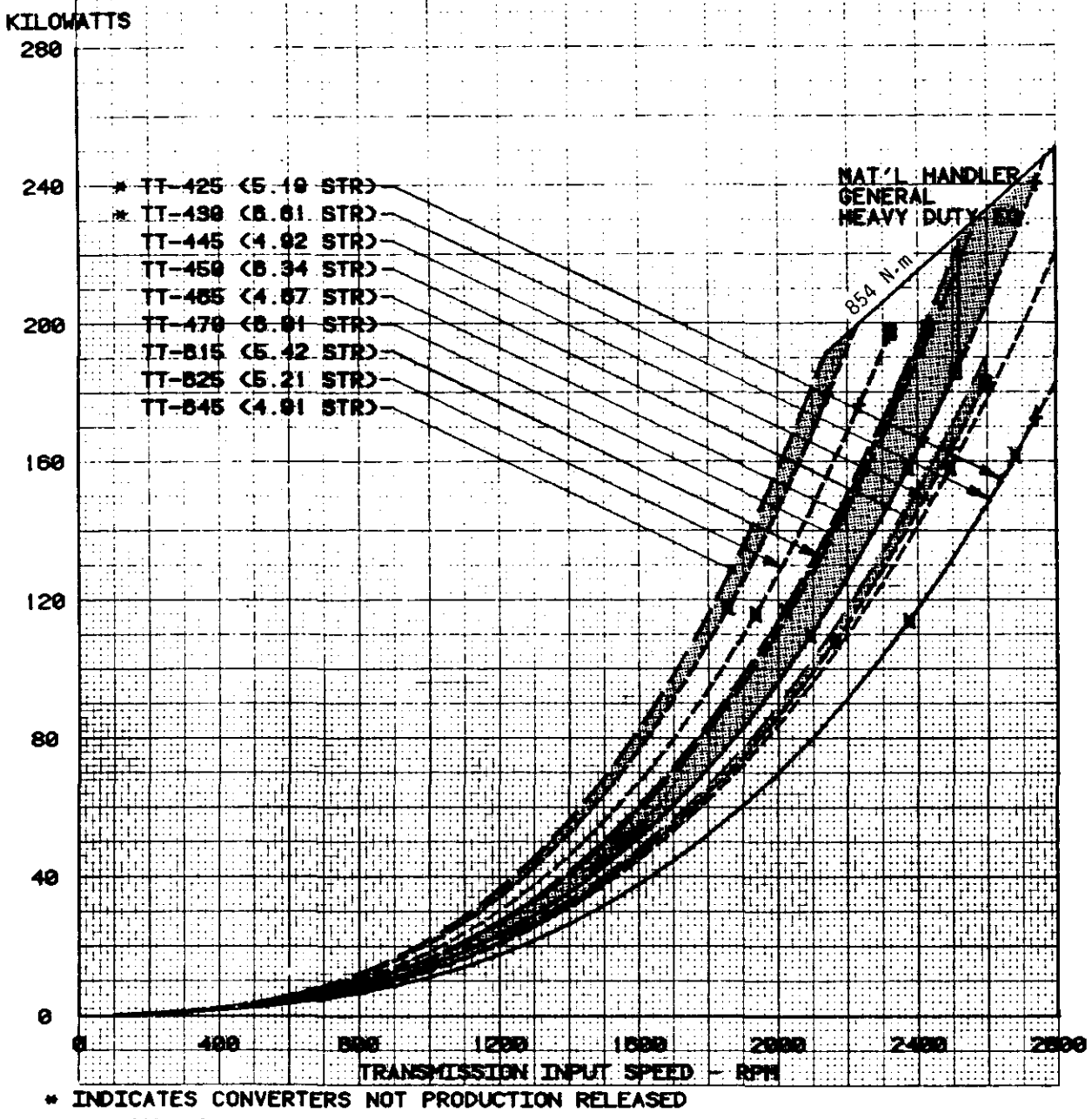
* INDICATES CONVERTERS NOT PRODUCTION RELEASED

REV. MCAHREN ,02-17-84

ALLISON TRANSMISSION	ENGR	RUSSELL	APPR	Q.T.A	TC-19068
RATING CHART TRT4821-1		11-19-80		3-5-84	SHEET 1 of 2

.846:1 T_2 RATIO

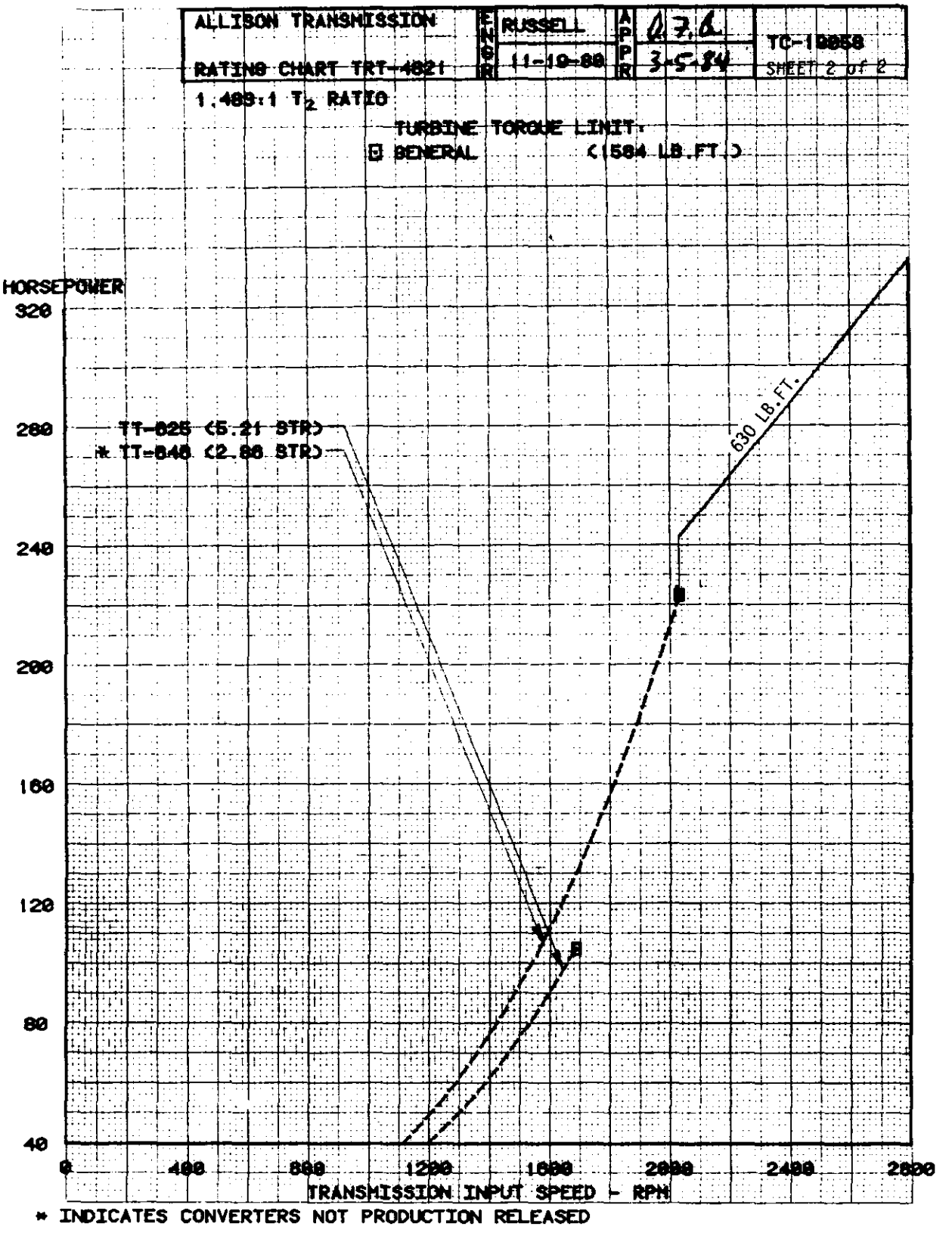
TURBINE TORQUE LIMIT:
- ⊡ MAT'L HANDLER (4059 N-M)
- + GENERAL (3758 N-M)
- ⊠ HEAVY DUTY EQ. (2618 N-M)



* INDICATES CONVERTERS NOT PRODUCTION RELEASED

FORM 3362-113-P(1)

REV. MCAHREN , 02-20-84



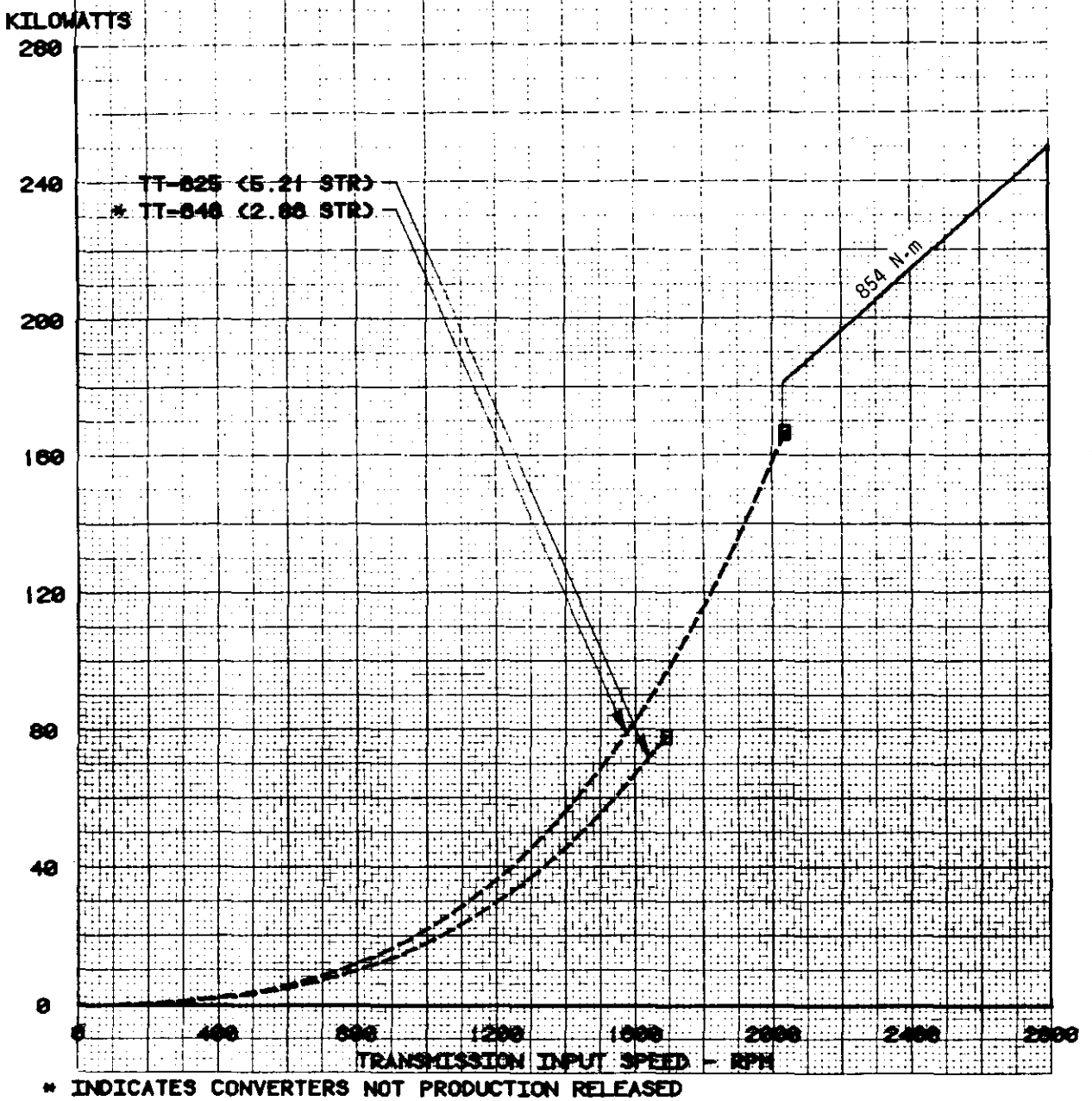
* INDICATES CONVERTERS NOT PRODUCTION RELEASED

REV. MCAHREN ,02-20-84

ALLISON TRANSMISSION	ENGR	RUSSELL	APPR	A.T.C.	TC-19858
RATING CHART TRT-4021	ENGR	11-19-80	APPR	3-5-84	SHEET 2 of 2

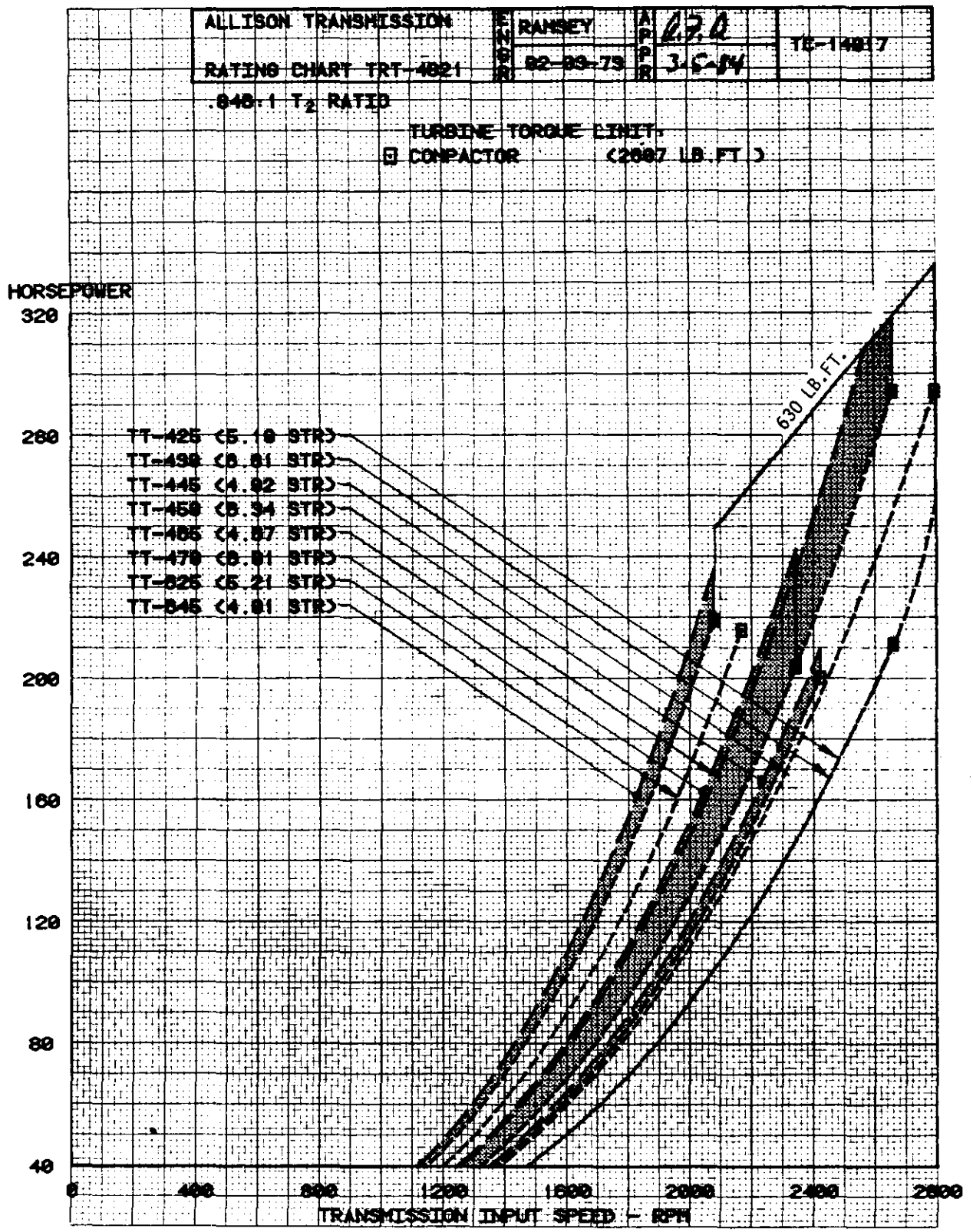
1.483:1 T_2 RATIO

TURBINE TORQUE LIMIT:
☐ GENERAL (2147 N-M)



* INDICATES CONVERTERS NOT PRODUCTION RELEASED

REV. MCAHREN ,02-17-84

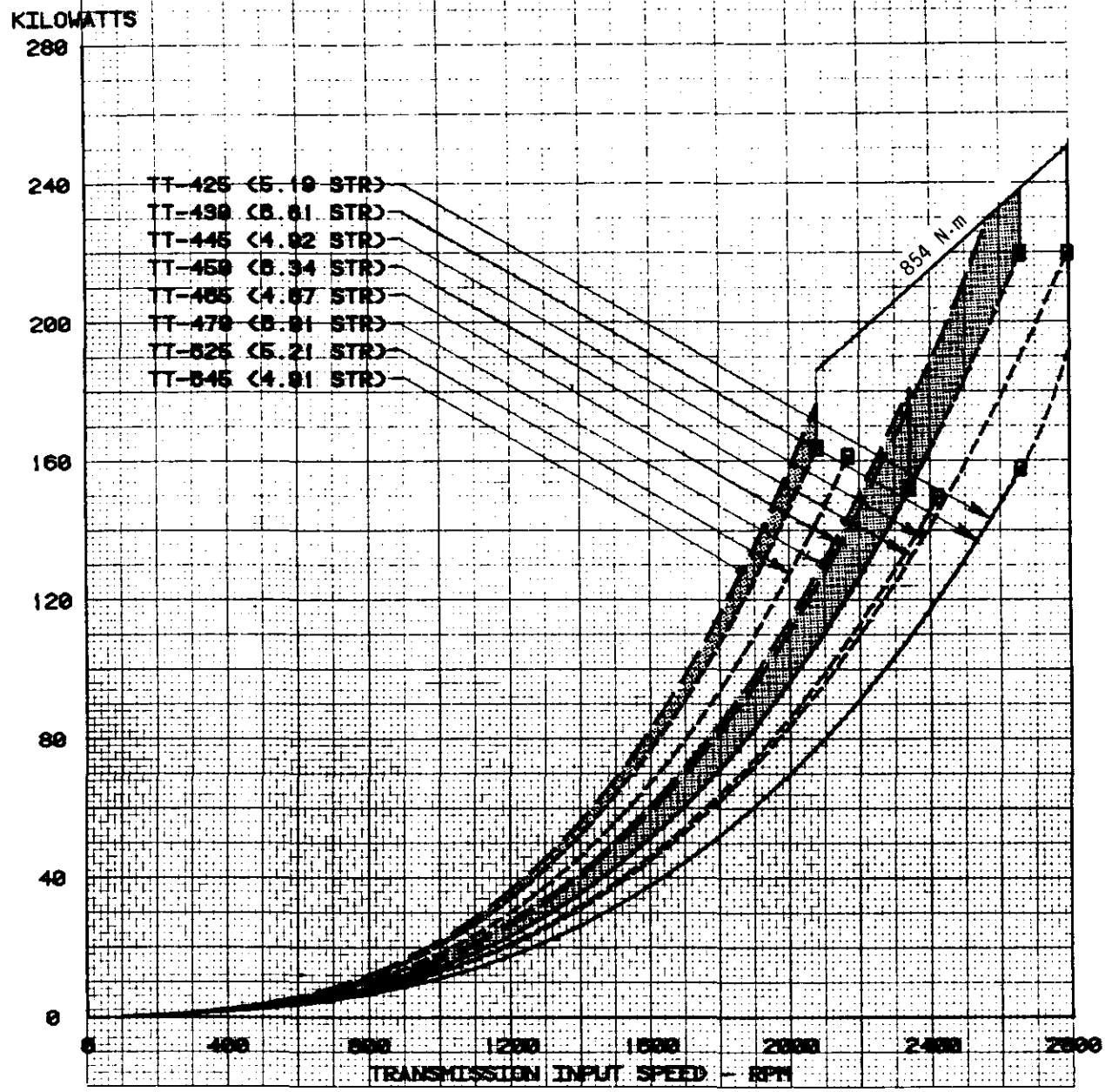


REV. MCAHREN ,02-17-84

ALLISON TRANSMISSION	ENGR	RAMSEY	APPR	0.7.a	TC-14017
RATING CHART TRT-4021		02-03-73		3-5-84	

.848:1 T_2 RATIO

TURBINE TORQUE LIMIT:
☐ COMPACTOR (3534 N-M)



FORM 4362-113-ACT

III. SUPPORT EQUIPMENT

R This section describes the required support equipment for the cycling transmissions and lists the suppliers of these items. The reliability and warranty coverage of these components are the responsibility of the supplier. Components from sources other than DDA have been evaluated only for functional compatibility with the DDA product.

Engine Adaptation Pieces

DDA Adaptation Drawings describe the physical adaptations of our transmissions with the various engines manufactured.

Input and Output Yokes and Flanges: (Ref. AS 00-011)

Yokes and flanges can be purchased with the transmission as a specified option or directly from the flange manufacturer.

Borg Warner
Mechanics Division
2020 Harrison Avenue
Rockford, IL 61101
Phone: (815) 398-3000

Dana Corporation
Heavy Duty Marketing Division
P.O. Box 321
Toledo, OH 43691
Phone: (419) 866-1841

Twin Disc, Inc.
1340 Racine Street
Racine, WI 53403
Phone: (414) 634-1981

Shift Controls: (Ref. AS 42-015)

American Standard
Wabco Fluid Power Division
1953 Mercer Road
Lexington, KY 40505
Phone: (616) 254-8031

Bennett Enterprises, Inc.
2649 Manana Drive
Dallas, TX 75220
Phone: (214) 351-9991

Weatherhead Company
Williams Air Control Division
14100 S.W. 72nd Avenue
Portland, OR 97223
Phone: (503) 639-3151

Clutch Cut-off Controls: (Ref. AS 00-027)

An air-actuated clutch cut-off feature is available as an option. A small air actuator is required to control the clutch cut-off feature.

Air Mite Devices, Inc.
4739 W. Montrose Avenue
Chicago, IL 60641
Phone: (312) 286-3393

Speedometer Drive: (Ref. AS 42-012)

Cycling transmissions use an SAE 5/32 heavy-duty drive.

Temperature and Pressure Gages: (Ref. AS 00-045)

Temperature and pressure gages are available with properly identified operating bands as shown on AS 00-045. The temperature gage is a capillary type with three different capillary lengths available. These gages may be ordered from DDA Service Parts:

R

Temperature Gage Part No.	Capillary Length
23010422	3.20-3.35 m 19'6"-11'0"
23010423	1.83-1.98 m 6'0"-6'6"
23010424	1.22-1.37 m 4'0"-4'6"

Pressure Gage: See AS 00-045

Neutral Start Switch: (Ref. AS 00-052)

These switches may be ordered from:

Part No.	Source
92102	Cole Hersee Company 22 Old Colony Avenue Boston, MA 02127 (617) 268-2100
21-380	Joseph Pollack Corporation 195 Freeport Street Boston, MA 02122 (617) 282-9550

The twin turbine transmissions have incorporated a provision for O.E.M. supplied neutral start switches since 1971. This provision is located on the control valve body on the end of the selector valve opposite the clevis connection, as shown on drawing AS 00-052. The selector valve has a raised land which lines up with the neutral start switch hole centerline to actuate the switch when in neutral position.

Switch, 12-gage wire Part No. DDA 23011922 Packard Electric Connector	Packard Electric Part No. 2989597 Connector 2962554 Terminal (2)	Packard Electric, GM P.O. Box 431 Warren, OH 44486 Phone: (216) 399-3020

Directional Signal Switch: (Ref. AS 42-015)
Sources listed below:

Description	Vendor Part No.	Source
Transmission-mounted	S-1733-1500	Fasco Industries P.O. Box 2250 Shelby, NC 28150 Phone: (704) 482-9582

Connection parts, directional signal switch to vehicle wiring:

(1) shell (2) sleeves (2) clips	5297887 5297052 2965638	Packard Electric, GM P.O. Box 431 Warren, OH 44486 Phone: (216) 399-3020

Power Take-offs: (Ref. AS 42-015)

PTO manufacturers listed below:

Dana Corporation
Power Equipment Division
P.O. Box 550
Chelsea, MI 48118
Phone: (313) 475-8641

Sperry Vickers Corporation
Tulsa Products Division
P.O. Box 6
Tulsa, OK 74115
Phone: (918) 836-3771

Heat Exchangers: (Ref. AS 00-051)

Heat exchanger manufacturers listed below:

Oil to Water

American Standard
Heat Transfer Division
P.O. Box 1102
Buffalo, NY 14240
Phone: (716) 897-2800

G & O Manufacturing Co.
138 Winchester Avenue
New Haven, CT 06508
Phone: (203) 562-5121

Modine Manufacturing Co.
1500 DeKoven Avenue
Racine, WI 53401
Phone: (414) 633-2411

Harrison Radiator Division GM
200 Upper Mountain Road
Lockport, NY 14094
Phone: (716) 439-3066

Heatex, Ltd.
2225 Lapierre St.
LaSalle 660, Quebec, Canada
Phone: (514) 365-6100

Perfex Group
500 W. Oklahoma
Milwaukee, WI 53207
Phone: (414) 744-1000

Sen-Dure Products, Inc.
Bay Shore, NY 11707
Phone: (516) 665-0689

Stewart-Warner Corporation
Southwind Division
1514 Drover Street
Indianapolis, IN 46221
Phone: (317) 682-8411

Young Radiator Co.
2825 Four Mile Road
Racine, WI 53404
Phone: (414) 639-1010

Oil to Air

Dunham Bush, Inc.
Riverside Division
1850 Massachusetts Avenue
Riverside, CA 92507
Phone: (714) 684-0991

Hayden Inc.
1531 Pomona Road
Corona, CA 91720
Phone: (714) 735-4900

Karmazin
3776 Eleventh Street
Wyandotte, MI 48192
Phone: (313) 282-3776

External Main Circuit Oil Filters: (Ref. AS 42-003)

Filter manufacturers are listed below:

AC Spark Plug Division, GM
1300 N. Dart Highway
Flint, MI 48556
Phone: (313) 766-5000

Schroeder Corporation
101 Nichol Avenue
McKees Rock, PA 15136
Phone: (412) 771-4810

Parking Brake: (Ref. AS 42-015)

A parking brake is available as an option with the transmission or may be purchased separately from the brake manufacturer.

Bendix
Automotive Controls Systems Group
401 North Bendix Drive
South Bend, IN 46634
Phone: (219) 237-2100

Rockwell International
Aftermarket Sales, Brakes
Troy, MI 48084
Phone: (313) 435-1382
(For nearest Rockwell Brake Distributor)

Auxiliary Heater

Auxiliary heaters can be adapted to the cycling transmissions.

Kim Hotstart Mfg. Co.
East 5724 Broadway, Box 42
Spokane, WA 99210
Phone: (509) 534-6171

Phillips Manufacturing Co.
8200 Grand Avenue, South
Minneapolis, MN 55420
Phone: (612) 888-4105

General Electric (Calrod)
Industrial Heating Products
One Progress Road
Shelbyville, IN 46176
Attn: Sales Manager
Phone: (317) 398-4411

Dipstick and Filltube: (Ref. AS 42-015)

Reference the Installation Manual for venting requirements. The Installation Drawings and contacts for special dipstick and filltube designers are listed below:

Estan Manufacturing Company
32053 Howard
Madison Heights, MI 48071
Phone: (313) 588-1137

Moeller Manufacturing Company
Greenville, MS 38701
Phone: (601) 335-2326

IV. INSTALLATION DRAWINGS

The Detroit Diesel Allison APPLICATION SPECIFICATION (AS) drawings for the TT 4000 series transmissions have been revised and updated to include the latest available information.

The TT 4000 series transmissions are represented by basic installation drawing AS 42-015 for both the models, TT 4721-1 and TRT 4821-1. Table 1 lists the AS drawing numbers and titles, all of which are applicable to both models. New AS drawings are created with SI METRIC units and the previous drawings using English units are being converted in order to follow the trend toward universal measurement.

Table 1 TT 4000 and TRT 4000 Installation Drawings List

Installation Drawing Numbers and Titles Applicable to both TT and TRT 4000-1 Models:	
AS 00-004	Single Filter Installation Data
AS 00-011	Drive Flange Chart
AS 00-026	Shift Tower Gating Patterns
AS 00-027	Air actuated Clutch Cutoff
AS 00-028	Inching Control Valve Body
AS 00-045	Off-highway Transmission Gauges
AS 00-051	Cooler Oil Flow Data
AS 00-052	Neutral Start Switch Provision
AS 42-003	External Hydraulic Circuit Requirements
AS 42-009	Flexplate Input Drive Data
AS 42-012	Speedometer Drive Option
AS 42-015	Basic Installation Drawing
AS 42-016	Implement and Steer Pump Drives

REFERENCE

MANUALS

SA 1171	TRT 4000	Service Manual
SA 1158	TRT 4000	Parts Catalog
SA 1362	TT 4700	Service Manual
SA 1158	TT 4700	Parts Catalog
SA 1363	TRT 4800	Service Manual
SA 1158	TRT 4800	Parts Catalog
SA 1336	T(R)T 4001	Operators Manual

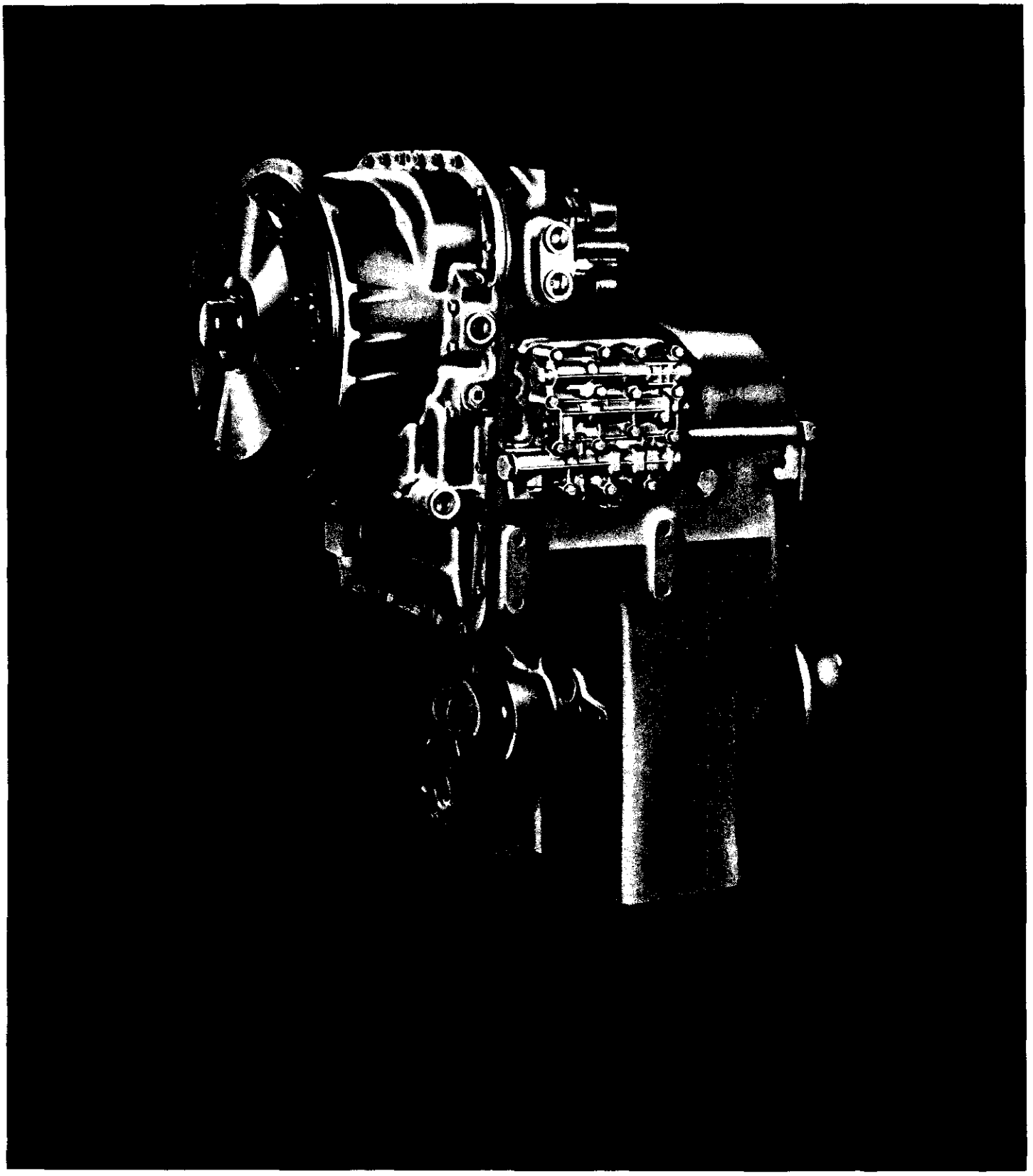
Prepared and Distributed by Sales Development, J5, Detroit Diesel Allison, P.O. Box 894, Indianapolis, Indiana 46206.

Allison Transmissions

cycling models

TT, TRT 4000 Series

up to 336 NHP (250 kW)

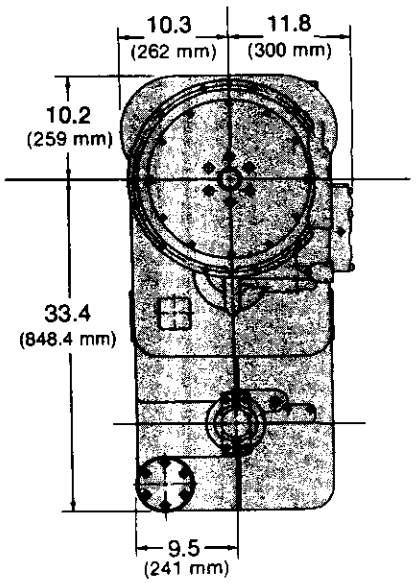


specifications

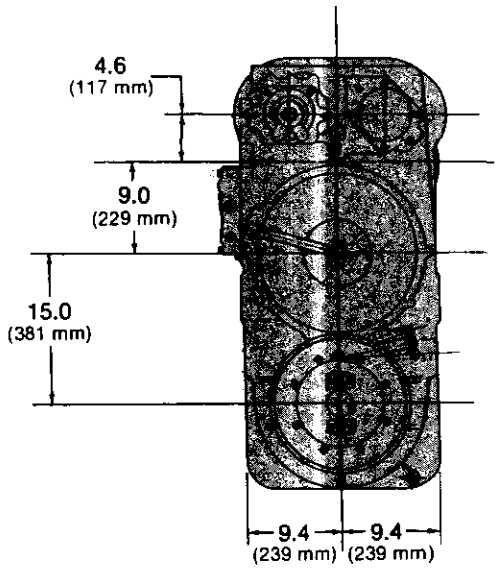
		TT 4721-1		TRT 4821-1	
rating	Input power, max. net Input torque, max. net Input speed, max.	235 hp (175 kW) 440 lb ft (597 N·m) 2800 rpm		336 hp (250 kW) 630 lb ft (854 N·m) 2800 rpm	
rotation	Input (viewed from input) Output (viewed from input)	Right hand Right hand (forward ranges)		Right hand Right hand (forward ranges)	
speeds	Forward Reverse	4 2		4 4	
mounting	Direct Remote	Modified SAE #2 converter housing with flexplate drive; mounting pads, each side Input flange or Torqmatic® coupling; mounting pads, each side			
torque converter	Type	2-phase, 4-element, twin turbine with automatic phase transition			
	Stall torque ratios	TT 445-4.92:1 TT 450-6.34:1 TT 465-4.67:1 TT 470-6.01:1 TT 615-5.25:1 TT 625-5.21:1 TT 645-4.91:1		TT 445-4.92:1 TT 450-6.34:1 TT 465-4.67:1 TT 470-6.01:1 TT 615-5.25:1 TT 625-5.21:1 TT 626-2.76:1* TT 645-4.91:1	
		*Only converter to be used with 1.483:1 T_2 gear ratios			
gearing	Type Range gears Transfer gears	Constant mesh spur, planetary Constant mesh spur, in-line			
	Gear ratios (includes transfer gear ratios, but not torque converter ratio)	.846:1 T_2		.846:1 T_2	1.483:1 T_2
		Standard	Optional		
	Forward low Forward high Reverse low Reverse high	2.710:1 .727:1 1.983:1 —	2.181:1 .727:1 1.983:1 —	2.581:1 .692:1 2.347:1 .629:1	4.515:1 1.210:1 4.106:1 1.100:1
clutches	Hydraulically-actuated, spring-released, oil cooled, multidisk, and automatically wear compensating				
parking brake (optional)	Type Size Rating	Internal expandable shoe 12 in x 3 in (305 x 76 mm) Max. intermittent burnished 90,000 lb in (10,169 N·m) @ 567 lbs (2560 N) apply force. Brake supplied unburnished			
power takeoff	Implement pump drive Rating Mounting pad Spline Size Ratio Accessory drive Rating Mounting pad Spline size Ratio	 160 hp (119 kW) max. intermittent power @ 2000-2800 rpm 120 hp (89 kW) max. continuous power @ 2000-2800 rpm SAE C 2/4 bolt SAE C, B (reducer) 1.00 x engine speed 160 hp (119 kW) max. intermittent power @ 2000-2800 rpm 120 hp (89 kW) max. continuous power @ 2000-2800 rpm SAE C 2/4 bolt SAE C, B (reducer) 1.00 x engine speed Note: 240 hp (179 kW) max. combined rating for both pads			
control valve body	Types	Mechanical, hydraulic, pneumatic or inching control			
oil system	Oil type Capacity (less external circuits) Filter	Hydraulic transmission fluid, Type C-3 10 U.S. gals (37.8 liters) Customer furnished, remote mounted			
size	Length, max. approx Width, max. approx Height, max. approx	47.40 in (1204 mm) 22.16 in (563 mm) 42.72 in (1085 mm)			
	Weight, max. approx	1585 lbs (719 Kg)		1730 lbs (785 Kg)	

Note: All data and specifications subject to change without notice.

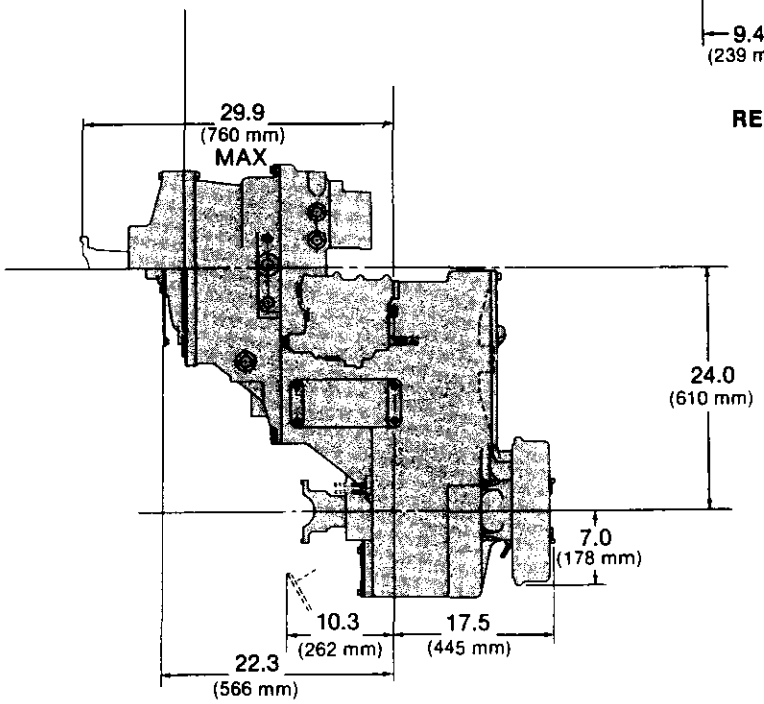
mounting dimensions



FRONT VIEW



REAR VIEW



SIDE VIEW

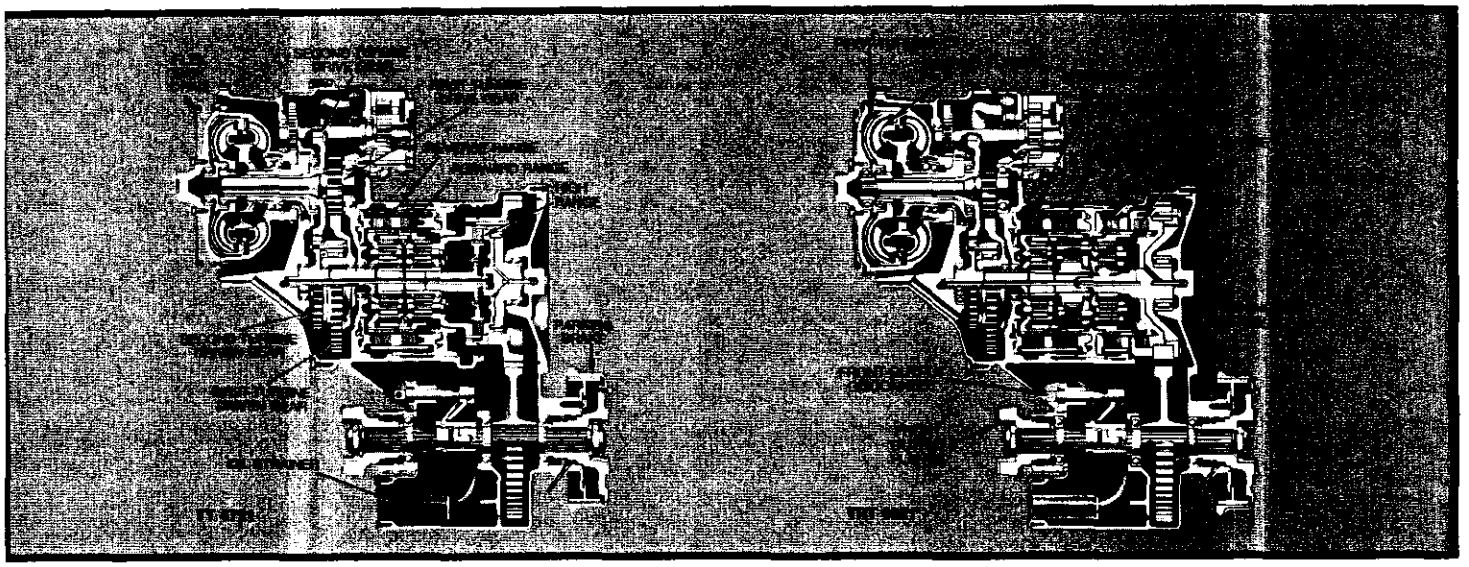
Note: Dimensions are given in inches with metric value in parentheses.

design features and options

- Transmission direct or remote mounted
- Parking brake
- Speedometer drive optional
- Choice of input and output flanges
- Torqmatic® coupling
- Front output disconnect
- Neutral start provision
- Forward and reverse pressure taps

TT, TRT 4000 series cycling transmissions

Applications for this series transmission are as varied as the number of cycling vehicles and vocations. Typical applications include wheel loaders, material handlers, self-propelled cranes, rail equipment and winches.

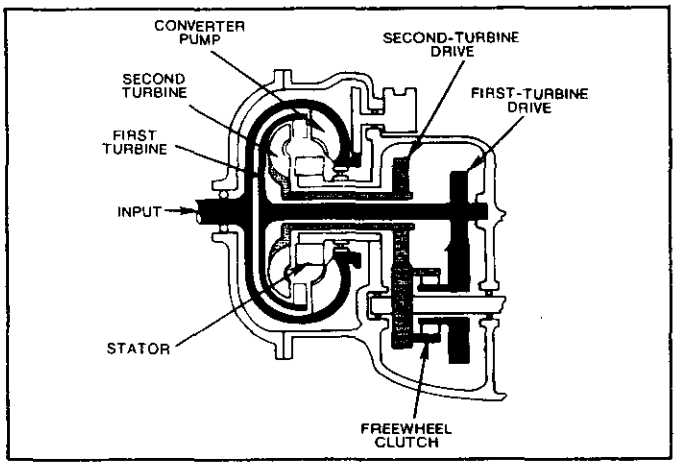


twin-turbine principle

The 4000 Series contain a twin-turbine torque converter. Essentially, this is a unit which has two turbines, one inside the other. Each turbine drives a different combining gear which drives the forward-reverse range gears.

When the load is started, oil flow within the converter causes the first turbine to turn, driving a low speed combining gear which, in turn, drives the range gears. As the load is reduced, due to increased vehicle movement, the higher velocity oil flow reaches the second turbine and causes it to turn. This drives the range gears through a higher speed combining gear. (The first turbine and its combining gear freewheel when the second turbine is operating at higher speeds.)

The result is automatic two-speed performance from the torque converter. When this is combined with two speeds in the range gearing, you get four-speed performance. Yet the operator only has two forward (and one or two reverse) shift lever positions to select.



'soft shift' system

Smooth shifting at a full power while changing direction of travel is the direct benefit of the Soft Shift system—a standard feature of all cycling series transmissions.

Soft Shift is a system of orifices and a trimmer in the main control valve body which modulates pressure to a dual-area piston providing a progressive application of force on the clutch. The metered flow of oils controls the torque peak automatically during clutch engagement. With Soft Shift, there is no more slowing down to shift, no more dangerous stalls. Shift shock is reduced, because . . .

SOFT SHIFT CONTROLS THE POWER.

This twin-turbine transmission, together with Soft Shift, offers an impressive array of advantages, including: faster hydraulic action, increased torque capacity; longer brake life; reduced cycle time.

WORLDWIDE REGIONAL OFFICES

Atlanta, Georgia (404/252-3314)
Oak Brook, Illinois (312/654-6600)
Dallas, Texas (214/659-5050)
Dearborn, Michigan (313/565-0411)
Edison, New Jersey (201/246-5074)
Fremont, California (415/498-5200)
Westlake Village, California (213/997-5405)
London, Ontario, Canada (519/452-5000)
Rotterdam, The Netherlands (010-290-000)
Dandenong, Victoria, Australia (797-7911)
Wembley, England (44-1-904-1749)
Coral Gables, Florida (305/446-4900)

OFFICES

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Ruesselsheim, Germany
Stockholm, Sweden
Wellingborough, England
Athens, Greece
Johannesburg, South Africa
Nairobi, Kenya
Adelaide, Australia
Brisbane, Australia
Sydney, Australia
Jakarta, Indonesia
Singapore
Tokyo, Japan
Bogota, Colombia
Buenos Aires, Argentina
Mexico City, Mexico
Santiago, Chile
Sao Paulo, Brazil

Detroit Diesel Allison

Detroit Diesel Allison
Division of General Motors Corporation
P.O. Box 894, Indianapolis, Indiana 46206
(317/244-1511)

SA 1154D 10-81

Litho U.S.A.

Allison Transmissions

SALES BRIEF

CODE
TOTAL UPDATE

Revised
Date 3/84 No. 78

5000 SERIES CYCLING TRANSMISSIONS

I. PRODUCT DESCRIPTION

The CRT 5633 and CRT 5643 power shift transmissions are designed primarily for cycling applications.

The CRT 5633 and CRT 5643 provide a powershift gear range of three-speeds forward and three-speeds reverse. These transmissions consist of a 3-element single-stage converter, engine-driven PTO's, constant-mesh planetary gearing, hydraulically-actuated clutches, dropbox with front and rear output, a provision for a neutral start switch, and a self-contained hydraulic system consisting of a sump, control valve body, and a charging pump.

The CRT 5633 and CRT 5643 are designed for wheel loaders, forklift trucks, compactors, motor graders, specialized mining equipment, rubber-tire tractors, log loaders, and similar cycling applications.

The CRT 5633 has three versions which are applicable depending upon vocation:

The CRT 5633-3:	loader version with dropbox, dual outputs, and an auxiliary lubrication pump.
The CRT 5633-5:	nonloader version with dropbox, dual outputs, and without an auxiliary lubrication pump.
The CRT 5633-7:	Customer supplied output version without auxiliary lube pump. Customer provides output shaft support, transmission oil sump and breather-filler requirements.

The CRT 5643-2 is a longer input-to-output drop version of the CRT 5633, which also has the dropbox, dual outputs, and auxiliary lubrication pump. The CRT 5643-2 has the lower converter capacity to replace the TT 4000 series transmission in 4.6-5.4 cubic meter (6-to-7 cu yd) loaders at the increased transmission rating of the CRT 5633 to provide a significant increase in reliability.

RATINGS

General Rating, Loader

Max. input speed:	2500 rpm	
Max. net input torque*:	1220 N·m	900 lb ft
Max. net input power*:	320 kW	430 hp
Max. turbine torque:	3688 N·m	2720 lb ft

All applications should use the "General Rating" with the exception of dozer applications.

Dozer Application Rating

Max. input speed:	2500 rpm	
Max. net input torque*:	1017 N·m	750 lb ft
Max. net input power*:	242 kW	325 hp
Max. turbine torque:	2807 N·m	2070 lb ft

*Net, as installed: inlet restriction, exhaust restriction, alternator, fan, idle steer pump, idle implement pump, and air compressor should be deducted when applicable.

Rating Charts Reference

CRT 5633:	TC-7330
CRT 5643:	TC-19060

Torque Converter

The CRT 5633 and CRT 5643 transmissions provide a single stage, three-element hydraulic torque converter. The CRT 5633 uses the TC 500 or the TC 400 series converters, while the CRT 5643 uses the lower capacity TC 400 series. The available converter models for each series and the stall ratio for each model is listed below.

CRT 5633 Converters

Converter Model	Absorption Chart No.	Stall Ratio
TC 430	TC-18774	3.59:1
TC 530	TC-9745	3.48:1
TC 540	TC-9746	2.64:1
TC 550	TC-9747	3.23:1
(TC 560)	TC-9748	2.58:1
TC 570	TC-7949	3.04:1
TC 580	TC-9750	2.81:1
FTC 430	TC-12557	3.56:1
FTC 450	TC-12639	3.32:1

( ) indicates converter assembly is not production released, but the parts are available.

CRT 5643 Converters

FTC 476	TC-19062	3.68:1

NOTE: Transmission applied in vocations with severe full throttle directional shifting will require converters with fixed stators, designated FTCxxx.

Control Valve Body Assembly

A mechanically-actuated, hydraulic control valve body is used to provide a powershift range selection. Manipulation of a directional-spool valve and a range-spool valve provide the 3-forward and 3-reverse ranges according to operator requirements. Forward low and reverse low are trimmed to provide a full-throttle and/or full-speed directional shifting capability. Optional valve bodies are available for hydraulic or pneumatic clutch cut-off features.

Gearing

Gear Data

Range gearing:	constant-mesh planetary
Transfer gearing:	constant-mesh inline
Gear type:	spur

Gear Ratios

1.000:1 Dropbox and Straight Through

	Low	Intermediate	High
F:	3.04:1	1.510:1	.760:1
R:	3.162:1	1.570:1	.790:1

1.300:1 Dropbox

F:	3.952:1	1.963:1	.988:1
R:	4.111:1	2.041:1	1.027:1

NOTE: To obtain overall transmission torque ratios, multiply the applicable torque converter ratio times the overall gear ratio.

Mounting

Direct

Front adaptation, CRT 5633: SAE =1, wet-type converter housing. Crankshaft-piloted flexdrive with converter flywheel. Ring gear drive also available. Type of adaptation depends on the engine model.

Front adaptation, CRT 5643: Modified SAE =2, wet-type converter housing with flexplate drive bolted to flywheel and converter hub piloted into flywheel. Universal for all engine models.

Side pads: Six .625-11 tapped holes are on each side. Cradle mounting between transmission side pads and engine flywheel housing pads are required.

Remote, CRT 5633 only

Input: A three-point mount is required. The front is trunnion mounted. Input flange for shaft is required and available.

Side pads: Mounts from both side pads are required with trunnion mount.

Output Configuration

The CRT 5633-3, CRT 5633-5 have two output locations available 469.9 mm (18.5 in.) below the input. The CRT 5643-2 has two output locations available 749.3 mm (29.5 in.) below the input. The input and output shaft rotation for these models as viewed from the input (in forward range) are indicated below:

CRT 5633 Input, clockwise; output, clockwise

CRT 5643 Input, clockwise, output, counterclockwise

The CRT 5633-7 has a stub-shaft output without a dropbox. The output housing and sump required are supplied by the customer. The output shaft rotation in forward is the same direction as its input, clockwise (as viewed from the input).

Clutch Data

Type:	Multidisk, hydraulically-actuated, spring-released, oil-cooled, automatically wear compensating.

Speedometer Drive*

Availability:	With 1.000:1 ratio dropbox only
Type:	SAE 5/32 heavy duty
Location:	Rear cover, refer to basic installation drawing
Shaft speed:	Equal to output speed
Rotation:	Opposite output rotation

* Parts are available, but assembly is not production released.

Transmission Breather

Currently, a breather is *not furnished* with the CRT 5633 and CRT 5643 transmission assemblies. A combination breather-filler tube cap such as A-C (Division GM) Part Number 6422635 must be supplied by the customer for the CRT 5633 until such time as it is supplied with the transmission as standard equipment. Such a cap is optional for the CRT 5643, since ports are available for a fill tube and for a breather. Refer to the basic installation drawing for each model to determine the size and location of these ports.

The above referenced breather is designed to fit a pipe or tube of 38.1-38.4 mm (1.500-1.510 in) outside diameter and 1.65 mm (.065 in) wall thickness. The outside diameter of the pipe or tube should be threaded back from the end 31.8 mm (1.25 in) for assembly.

Parking Brake

Availability:	Optional on dual output models of the CRT 5633 only at the rear output "D" position.
Description:	305 × 127 mm (12 × 5 in) internal expandable shoe.
Rating:	Maximum intermittent rating, burnished*, 10,169 N·m (90,000 lb in) at 2225 N (500 lb) apply force. Continuous design rating is 75 percent of maximum rating.

*Brakes are shipped unburnished. Unburnished capacity is only 35 percent of rated capacity.

Special Operational Control Provisions

Neutral Start Provision.

An installation provision for a neutral start switch connected in series with the vehicle start system is standard on the CRT 5643-2 only. (Ref. AS 56-028.)

Forward and Reverse Pressure Taps.

The transmission valve body and taps which supply either forward or reverse hydraulic pressure can be used for special operational controls or indicators. (Ref. basic installation drawings.)

SPECIFICATIONS

Weight, Dry, Approximate

CRT 5633:	1090-1140 kg (2400-2500 lbs) depending upon model and options.
CRT 5643-2:	1132 kg (2495 lb).

Oil System

Oil Capacity. Less external circuits.

Initial fill:	49.2 liters (13.0 U.S. gal.)
Refill:	42.6 liters (11.25 U.S. gal.)

Oil Filter

CRT 5633:	Either remote-mounted filters supplied by the customer or integral dual full-flow oil filters are optional. (Ref. AS 56-021.)
CRT 5643:	The oil filter is supplied by the customer and remotely-mounted from the transmission. (Ref. AS 56-026.)

Oil Type: Hydraulic transmission fluid, C-3.

Oil Pump: Input driven, positive displacement, gear type.

Main Oil Pressure: At full throttle: 896-965 kPa (130-140 psi).

Oil Temperature:

Max. converter out: 135°C (275°F) continuous.

Power Take-off Provisions

CRT 5633.

Gear-drive PTO, lower-right side.

Ratio:	1.000 × engine speed
Rating:*	
Max. intermittent power, 2100 to 2500 rpm:	149 kW 200 hp
Max. continuous power, 2100 to 2500 rpm:	95 kW 125 hp
Mounting pad:	SAE 8-bolt heavy duty
Gear spec:	6 pitch, 46 teeth.

Accessory-drive PTO shaft, rear of converter housing (Non Loader Version only)

Ratio:	1.000 × engine speed
Rating:*	
Max. intermittent power, 2100 to 2500 rpm:	149 kW 200 hp
Max. continuous power, 2100 to 2500 rpm:	95 kW 125 hp
Mounting pad:	SAE C 4-bolt
Shaft spline:	SAE C.

* 149 kW (200 hp) max. intermittent
95 kW (125 hp) max. continuous
Combined rating for both pads.

CRT 5643

Implement-drive PTO, upper-left side of adapter housing

Ratio:	1.000 × engine speed
Rating:*	
Max. intermittent power, 2000 to 2500 rpm:	149 kW 200 hp
Max. continuous power, 2000 to 2500 rpm:	112 kW 150 hp
Mounting pad:	SAE C 2/4 Bolt
Spline size:	SAE C

Accessory-drive PTO, upper-right side of adapter housing

Ratio:	1.000 × engine speed
Rating:*	
Max. intermittent power, 2000 to 2500 rpm:	149 kW 200 hp
Max. continuous power, 2000 to 2500 rpm:	112 kW 150 hp
Mounting pad:	SAE C 2/4 Bolt
Spline size:	SAE C

*186 kW (250 hp) maximum combined rating for both pads.

II. TRANSMISSION RATING CHARTS

Each transmission rating chart is expressed in metric power (kW) on one side and U.S. horsepower (HP) on the other side. The rating charts are compatible with net engine power corrected to the SAE J1349 Engine Test Code.

The following information may be helpful for interpreting and adjusting engine data for use with the rating charts.

SAE J1349 ENGINE TEST CODE BASELINE

Condition	Metric	U.S.
Pressure-Total	100 KPa	29.61 in Hg
Temperature	25°C	77° F
Vapor Pressure	1.0 KPa	.2961 in Hg
Dry Baro Pressure	99 KPa	29.31 in Hg
Dry Air Density	1.157 Kg/m^3	.0722 lb/ft^3
Fuel Temperature	40 ± 3°C	104 ± 5.4°F

ENGINE POWER & TORQUE CONVERSION FORMULAES

US --- United States Customary
SI --- International System of Units (New Metric)
NSI --- Centimetre, Gram, Second System (Old Metric)

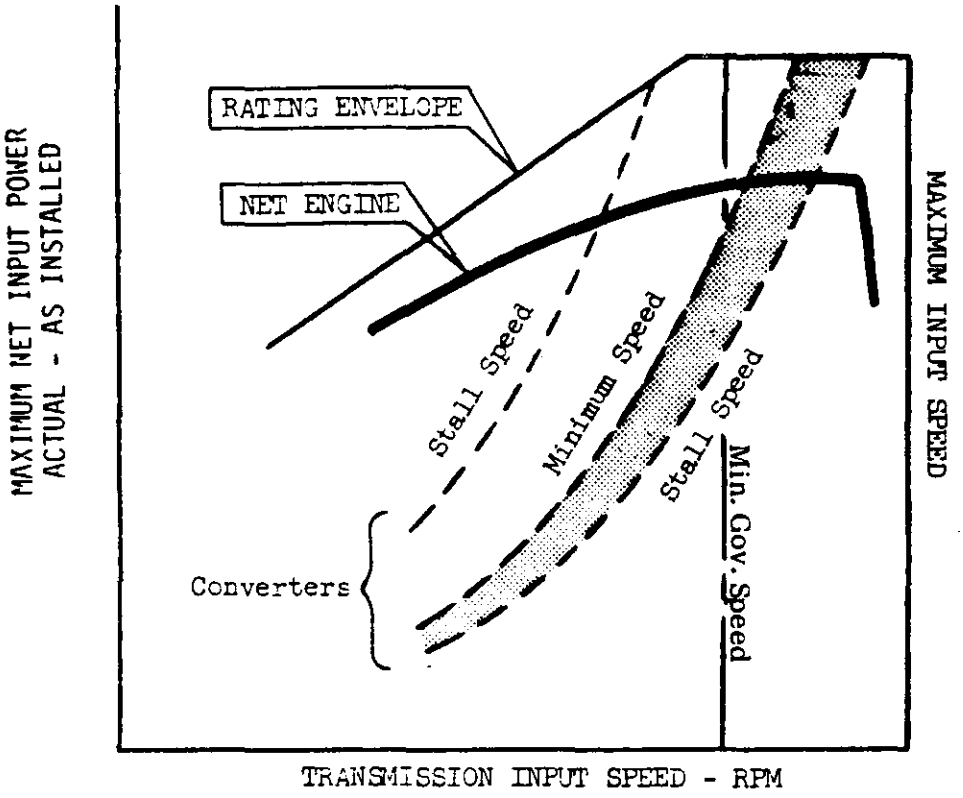
	UNITS		
	US	SI	NSI
TORQUE	LB.FT.	N·m	TORQUE (m)
POWER	HP	KW	HP (m)

Torque (m)
Metre-Kilogram Symbols
mk·p
kg·m
mkg
kgm

HP (m)
Metric Horsepower Symbols
PS (Pferde Stärke)
CV (Cheval - Vapeur)
hk (häst kraft)
pk (paarde kracht)

LB.FT. = Torque (m) X 7.233 HP = HP (m) X 0.9863	N·m = Torque (m) X 9.807 kW = HP (m) X 0.7355
$HP = \frac{\text{Torque (m) X r/min}}{726}$ $HP = \frac{\text{LB.FT. X r/min}}{5252}$	$kW = \frac{\text{Torque (m) X r/min}}{974}$ $kW = \frac{\text{N·m X r/min}}{9549}$

TYPICAL RATING CHART



A typical rating chart consists of a solid line envelope expressed in terms of power and speed, and a series of dotted lines each representing the capacity characteristics of the converters used in the transmission. In some instances, because of the converter's speed characteristics, the converter is defined by a band shown by dual dotted curves in which case the first line of the band represents the minimum speed characteristics and the second line the stall speed.

All rating charts carry a maximum input (governed) speed rating, whereas only a few have a minimum governed speed limit. In these cases, the full load governed speed of the engine must fall on or above the minimum governed speed line but cannot exceed the maximum input speed rating.

To determine whether a given engine is within the rating of a converter and transmission, the net engine curve must be plotted on the rating chart as follows:

- Correct gross engine to SAE J1349 baseline and deduct engine accessories.
- Plot this net engine power curve (corrected power less accessories) on converter or transmission rating chart.
- Investigate converter and lockup operation in the following manner after selecting proper converter.

CONVERTER OPERATION (All Transmissions)

The net engine power curve must intersect the converter stall line within the envelope as defined by the solid line envelope.

If the converter speed characteristics are represented by a band (shaded area), the power curve of the engine must intersect both lines of the converter within the rating envelope.

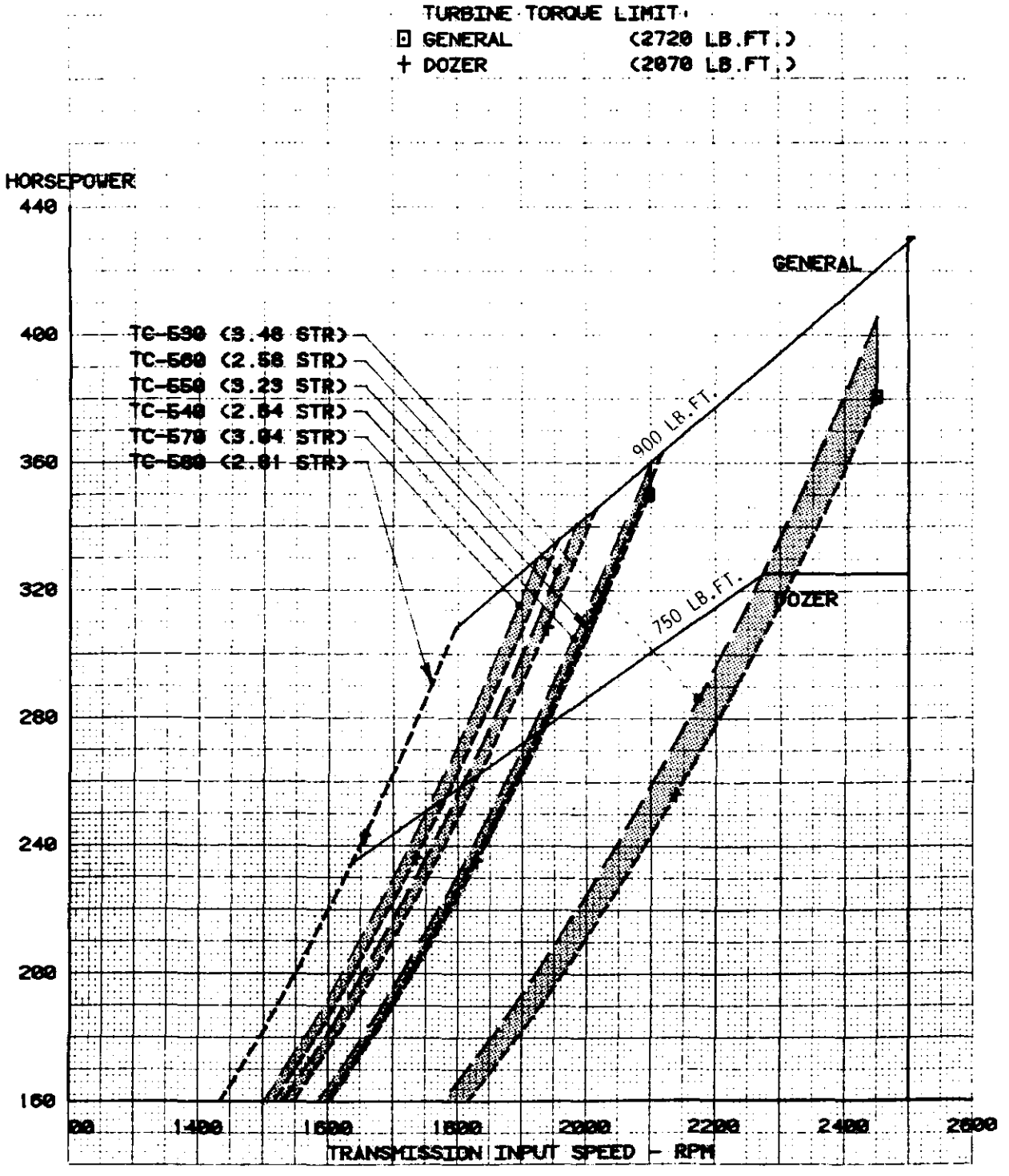
LOCKUP OPERATION (Transmissions with Lockup)

The engine power curve must fall below the solid-line envelope for all speeds defined by the rating envelope.

REV. MCAHREN ,02-20-84

ALLISON TRANSMISSION	ENGR	ALBIN	APPR	A.T.A.	TC-7338
RATING CHART CRT-5833		05-22-78		3-5-84	

1.0 & 1.3 DROPBOX

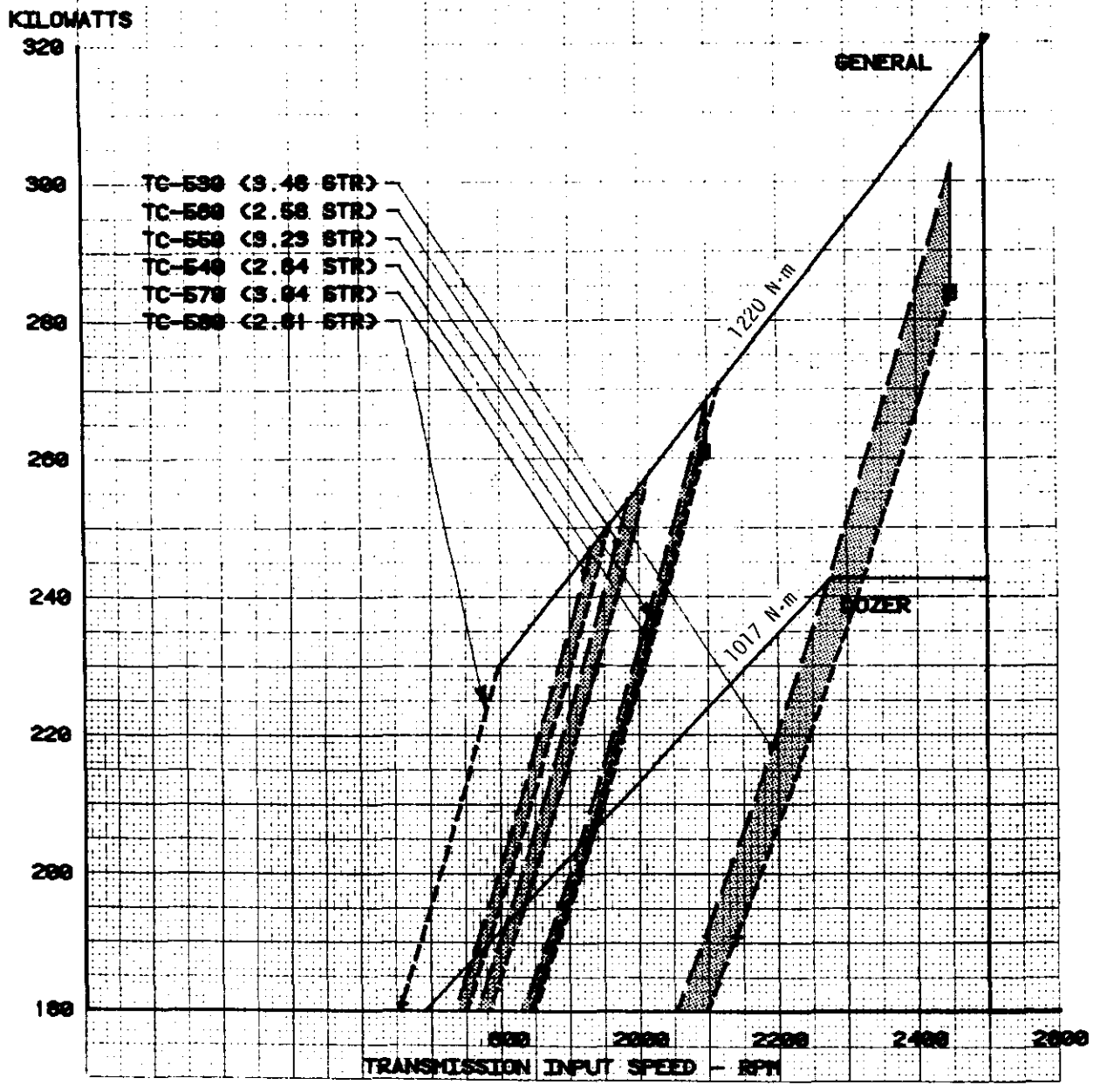


REV. MCAHREN ,02-20-84

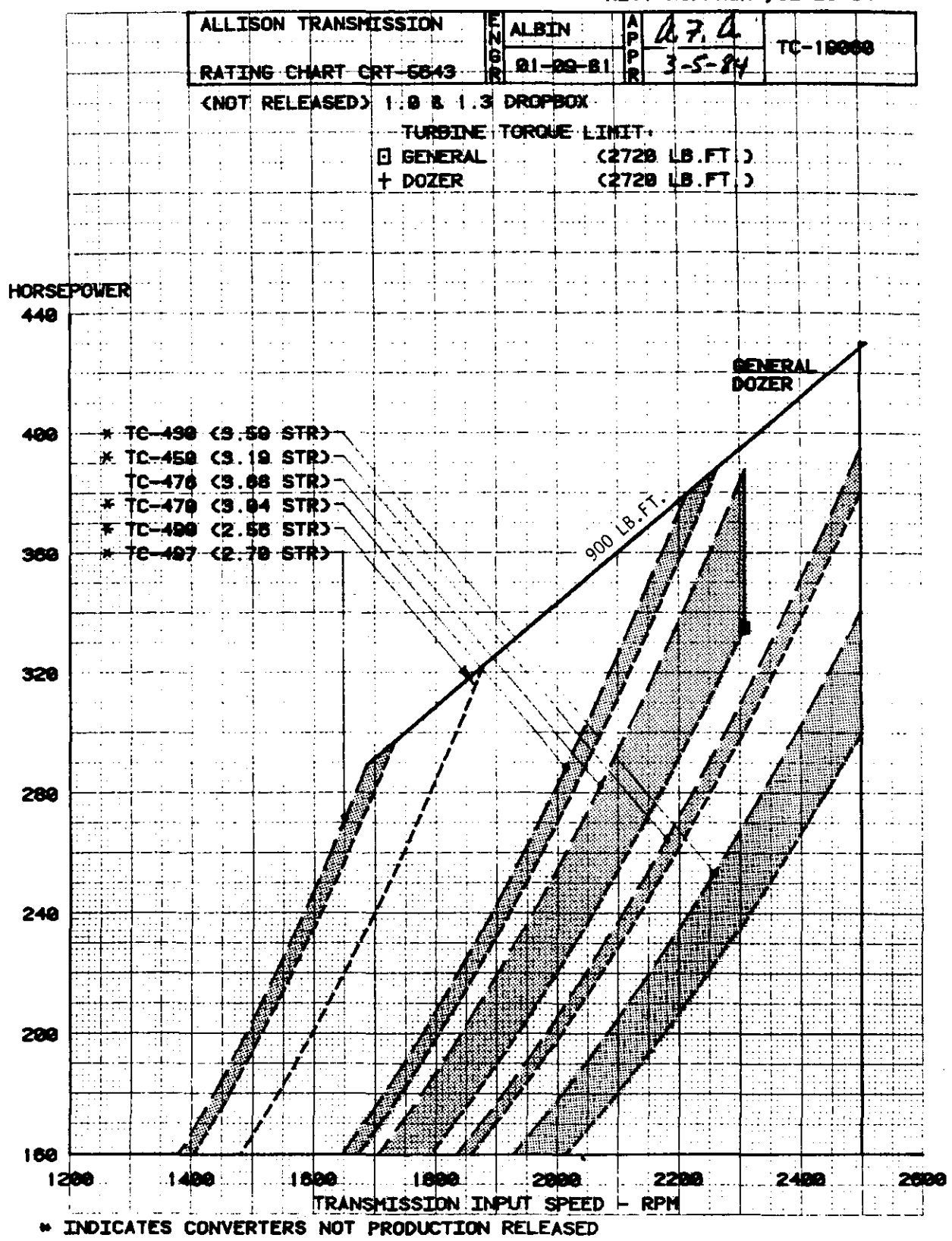
ALLISON TRANSMISSION	ENGR	ALBIN	APPR	A.T.A.	TC-7390
RATING CHART CRT-5693		05-22-78		3-5-84	

1.0 & 1.3 DROPBOX

TURBINE TORQUE LIMIT:
⊡ GENERAL (3687 N-M)
+ DOZER (2696 N-M)



REV. MCAHREN ,02-20-84



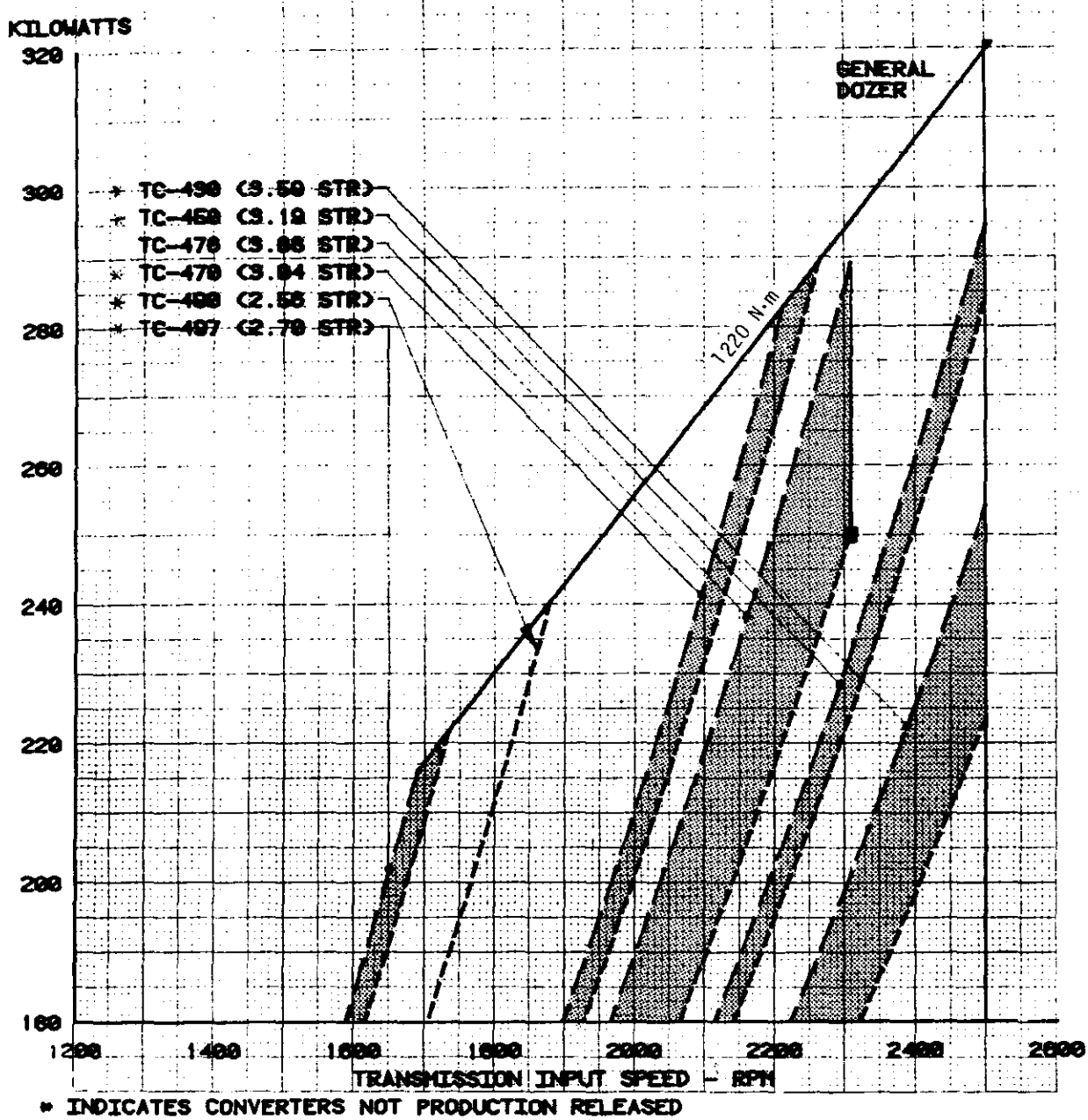
* INDICATES CONVERTERS NOT PRODUCTION RELEASED

REV. MCAHREN ,02-20-84

ALLISON TRANSMISSION	ENGR	ALBIN	APPR	A.F.C.	TC-19000
RATING CHART CRT-5543		01-20-81		3-5-84	

(NOT RELEASED) 1.0 & 1.3 DROPBOX

TURBINE TORQUE LIMIT:
⊡ GENERAL (3667 N-M)
+ DOZER (3667 N-M)



* INDICATES CONVERTERS NOT PRODUCTION RELEASED

III. SUPPORT EQUIPMENT

R This section describes the required support equipment for the cycling transmissions and lists the suppliers of these items. The reliability and warranty coverage of these components are the responsibility of the supplier. Components from sources other than DDA have been evaluated only for functional compatibility with the DDA product.

Engine Adaptation Pieces

DDA Adaptation Drawings describe the physical adaptations of our transmissions with the various engines manufactured.

Input and Output Yokes and Flanges: (Ref. AS 58-035)

Yokes and flanges can be purchased with the transmission as a specified option or directly from the flange manufacturer. Reference drawings for each of the following series of our transmissions and flange manufacturers are listed below:

Borg Warner
Mechanics Division
2020 Harrison Avenue
Rockford, IL 61101
Phone: (815) 398-3000

Dana Corporation
Heavy Duty Marketing Division
P.O. Box 321
Toledo, OH 43691
Phone: (419) 866-1841

Twin Disc, Inc.
1340 Racine Street
Racine, WI 53403
Phone: (414) 634-1981

Shift Controls: (Ref. AS 56-015, AS 56-016, AS 56-024)

American Standard
Wabco Fluid Power Division
1953 Mercer Road
Lexington, KY 40505
Phone: (606) 254-8031

Bennett Enterprises, Inc.
2649 Manana Drive
Dallas, TX 75220
Phone: (214) 351-9991

Weatherhead Company
Williams Air Control Division
14100 S.W. 72nd Avenue
Portland, OR 97223
Phone: (503) 639-3151

Clutch Cut-off Controls: (Ref. AS 56-019)

An air-actuated clutch cut-off feature is available as an option. A small air actuator is required to control the clutch cut-off feature.

Air Mite Devices, Inc.
4739 W. Montrose Avenue
Chicago, IL 60641
Phone: (312) 286-3393

Speedometer Drive: (Ref. AS 56-015, AS 56-016, AS 56-024)

Cycling transmissions use an SAE 5/32 heavy-duty drive.

Temperature and Pressure Gages.

Temperature and pressure gages are available with properly identified operating bands as shown on AS 00-045. The temperature gage is a capillary type with three different capillary lengths available. These gages may be ordered from DDA Service Parts:

Temperature Gage Part No.	Capillary Length
R 23010422	3.20-3.35 m 10'6"-11'0"
23010423	1.83-1.98 m 6'0"-6'6"
23010424	1.22-1.37 m 4'0"-4'6"

Pressure Gage: See AS 00-045

Neutral Start Switch: (Ref. AS 56-028)

The neutral start function is not a part of the CRT 5633 transmission assembly. These switches may be ordered from:

Part No.	Source
92102	Cole Hersee Company 22 Old Colony Avenue Boston, MA 02127 (617) 268-2100
21-380	Joseph Pollack Corporation 195 Freeport Street Boston, MA 02122 (617) 282-9550

Directional Signal Switch: (Ref. AS 56-015, AS-56-016, AS 56-024)

Sources listed below:

Description	Vendor Part No.	Source
Transmission-mounted	S-1733-1500	Fasco Industries P.O. Box 2250 Shelby, NC 28150 Phone: (704) 482-9582

Connection parts, directional signal switch to vehicle wiring:

(1) shell	5297887	Packard Electric, GM P.O . Box 431 Warren, OH 44486 Phone: (216) 399-3020
(2) sleeves	5297052	
(2) clips	2965639	

Power Take-offs: (Ref. AS 56-015, AS 56-016, AS 56-024)

PTO manufacturers listed below:

Dana Corporation
Power Equipment Division
P.O. Box 550
Chelsea, MI 48118
Phone: (313) 475-8641

Sperry Vickers Corporation
Tulsa Products Division
P.O. Box 6
Tulsa, OK 74115
Phone: (918) 836-3771

Heat Exchangers: (Ref. AS 00-022, AS 56-051)

Heat exchanger manufacturers listed below:

Oil to Water

American Standard
Heat Transfer Division
P.O. Box 1102
Buffalo, NY 14240
Phone: (716) 897-2800

G & O Manufacturing Co.
138 Winchester Avenue
New Haven, CT 06508
Phone: (203) 562-5121

Modine Manufacturing Co.
1500 DeKoven Avenue
Racine, WI 53401
Phone: (414) 633-2411

Perfex Group
500 W. Oklahoma
Milwaukee, WI 53207
Phone: (414) 744-1000

Harrison Radiator Division, GM
200 Upper Mountain Road
Lockport, NY 14094
Phone: (716) 439-3066

Sen-Dure Products, Inc.
Bay Shore, NY 11707
Phone: (516) 665-0689

Heatex, Ltd.
2225 Lapierre St.
LaSalle 660, Quebec, Canada
Phone: (514) 365-6100

Stewart-Warner Corporation
Southwind Division
1514 Drover Street
Indianapolis, IN 46221
Phone: (317) 682-8411

Young Radiator Co.
2825 Four Mile Rd.
Racine, WI 53404
Phone: (414) 639-1010

Oil to Air

Dunham Bush, Inc.
Riverside Division
1850 Massachusetts Avenue
Riverside, CA 92507
Phone: (714) 684-0991

Hayden Inc.
1531 Pomona Road
Corona, CA 91720
Phone: (714) 735-4900

Karmazin
3776 Eleventh Street
Wyandotte, MI 48192
Phone: (313) 282-3776

External Main Circuit Oil Filters: (Ref. AS 56-021, AS 56-026)

Specifications for filters are shown on respective AS drawings and the filter manufacturers are listed below:

AC Spark Plug Division GM
1300 N. Dart Highway
Flint, MI 48556
Phone: (313) 766-5000

Schroeder Corporation
101 Nichol Avenue
McKees Rock, PA 15136
Phone: (412) 771-4810

Parking Brake: (Ref. AS 56-015, AS 56-016, AS 56-024)

A parking brake is available as an option with the transmission or may be purchased separately from the brake manufacturer.

Bendix
Automotive Controls Systems Group
401 North Bendix Drive
South Bend, IN 46634
Phone: (219) 237-2100

Rockwell International
Aftermarket Sales, Brakes
Troy, MI 48084
Phone: (313) 435-1382
(For nearest Rockwell Brake Distributor)

Auxiliary Heater

Auxiliary heaters can be adapted to the cycling transmissions.

Kim Hotstart Mfg. Co.
East 5724 Broadway, Box 42
Spokane, WA 99210
Phone: (509) 534-6171

General Electric (Calrod)
Industrial Heating Products
One Progress Road
Shelbyville, IN 46176
Attn: Sales Manager
Phone: (317) 398-4411

Phillips Manufacturing Co.
8200 Grand Avenue, South
Minneapolis, MN. 55420
Phone: (612) 888-4105

Dipstick and Filltube: (Ref. AS 56-015, AS 56-016, AS 56-024)

Reference the Installation Manual for venting requirements. Contacts for special dipstick and filltube designers are listed below:

Estan Manufacturing Company
32053 Howard
Madison Heights, MI 48071
Phone: (313) 588-1137

Moeller Manufacturing Company
Greenville, MS 38701
Phone: (601) 335-2326

IV. INSTALLATION DRAWINGS

The Detroit Diesel Allison Application Specification (AS) drawings for the CRT series transmissions have been revised and updated to include the latest available information.

The CRT series transmissions are represented by the following basic installation drawings:

Transmission Model	Basic Drawing Number
CRT 5633-3	AS 56-015
CRT 5633-5	AS 56-016
CRT 5633-7	AS 56-017
CRT 5643-2	AS 56-024

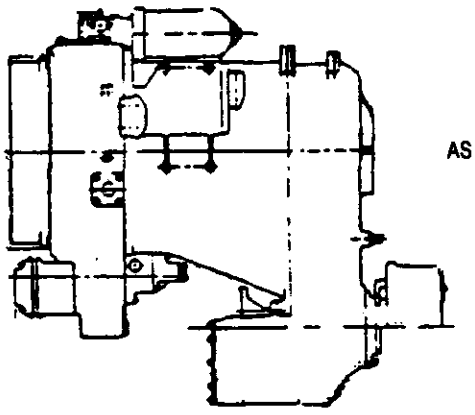
Figure 1 shows the major profile differences of the various CRT 5000 models and references the basic drawing numbers of each.

Table 1 lists all the CRT series AS installation drawings. The title of the drawing and code of applicable transmission model is referenced.

Table 2 lists all CRT physical adaptation drawings which are designated AS 04-xxx drawings. The engine manufacturer and engine model is indicated for each application.

New drawings are created with SI Metric units. Earlier drawings using English units are being converted as the drawings come up for revision, following the trend to universal measurements.

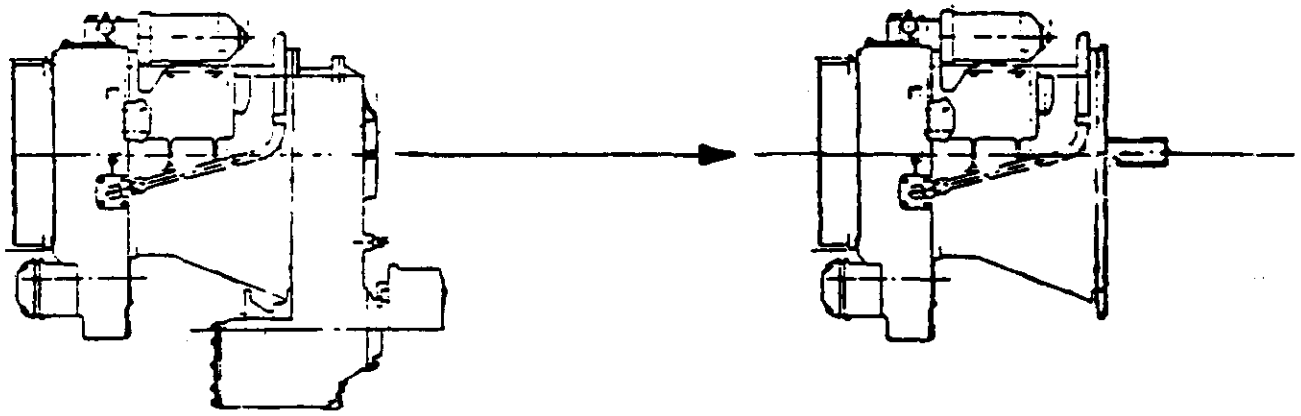
CRT 5633-3, CRT 7033-3
LOADER VERSION



AS 56-015

CRT 5633-5, CRT 7033-5
NONLOADER VERSION

CRT 5633-7
STUBSHAFT VERSION



CRT 5643-2

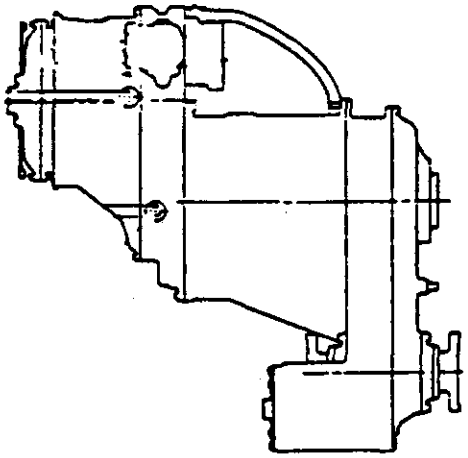


Figure 1 CRT Basic Model Profiles

Table 1 CRT Series Installation Drawings

Drawing Number	Drawing Title	Applicable Model Codes A=CRT 5633-3 Loader B=CRT 5633-5 Nonloader C=CRT 5633-7 Stub Shaft D=CRT 5643-2 Applicable Model Codes
AS 00-001	Transmission Drive Adaptation Chart	A, B, C
AS 00-002	Engine/Transmission Adaptation Requirements	A, B, C
AS 00-003	Transmission Trunnion Support	A, B, C
AS 00-045	Off-highway Transmission Gages	A, B, C, D
AS 00-051	CRT 5643 Cooler Oil Flow	D
AS 56-005	Side PTO Option	A, B, C
AS 56-007	Implement Pump Drive Option	A, B, C
AS 56-015	Basic Installation Drawing	A
AS 56-016	Basic Installation Drawing	B
AS 56-017	Output Option without Transfer Housing	C
AS 56-018	Auxiliary Lube Circuit	A
AS 56-019	Air-actuated Clutch Cutoff	A, B, C
AS 56-020	Hydraulic Clutch Cutoff	A, B, C
AS 56-021	External Hydraulic Circuit	A, B, C
AS 56-022	CRT 5633 Cooler Flow Data	A, B, C
AS 56-024	Basic Installation Drawing	D
AS 56-025	Flexplate Input Drive Data	D
AS 56-026	External Hydraulic Circuit Requirements	D
AS 56-028	Neutral Start Switch Provision	D
AS 56-029	Implement Pump Clearance Information	D
AS 56-030	Implement Pump Drive Data	D
AS 58-035	Drive Flange Data	A, B, C, D

Table 2 CRT 5633, CRT 7033 Adaptation Drawings

Drawings Number	Engine Manufacturer	Engine Models
AS 04-024	CUMMINS	NH Inline Models (855 cu in.)
AS 04-025	DETROIT DIESEL	71 Series
AS 04-036	DETROIT DIESEL	6-110
AS 04-038	CUMMINS	VT12, NVK-450, V12-525, VT12-635, VT12-700 Phase I
AS 04-051	CATERPILLAR	1673, D-333
AS 04-055	CATERPILLAR	D-343
AS 04-065	DEUTZ	F12L-714
AS 04-094	DEUTZ	F8L-714
AS 04-110	CUMMINS	V1710, VT1710, VTA1710 Phase III
AS 04-118	CATERPILLAR	D346-E231
AS 04-164	CUMMINS	K Series
AS 04-165	DETROIT DIESEL	92 Series
AS 04-196	CATERPILLAR	3406, 3408 (SAE =1 HSG)
AS 04-197	CATERPILLAR	3412 (SAE =0 HSG)

REFERENCES

Manuals

SA 1083	CRT 5630, 31	Service Manual
SA 1076	CRT 5630, 31	Parts Catalog
SA 1547	CRT Series	Service Manual
SA 1559	CRT Series	Parts Catalog
SA 1355	CRT Series	Operators Manual

Prepared and distributed by Sales Development, J5, Detroit Diesel Allison, P.O. Box 894, Indianapolis, IN 46206.

Allison Transmissions

SALES BRIEF

CODE
NEW SALES BRIEF

Revised
Date 3/84 No. 87

7000 SERIES CYCLING TRANSMISSIONS

I. PRODUCT DESCRIPTION

The CRT 7033 power shift transmission is designed primarily for cycling applications.

The CRT 7033 provides a powershift gear range of three-speeds forward and three-speeds reverse. This transmission consists of a three-element single-stage converter, engine-driven PTO's, constant-mesh planetary gearing, hydraulically-actuated clutches, dropbox with front and rear output, a provision for a neutral start switch, and a self-contained hydraulic system consisting of a sump, control valve body, and a charging pump.

The CRT 7033 model is designed for extreme duty and/or extra long life requirements in wheel loaders, forklift trucks, compactors, motor graders, specialized mining equipment, rubber-tire tractors, log loaders, and similar cycling applications.

The CRT 7033 has two versions which are applicable depending upon vocation:

The CRT 7033-3: loader version with dropbox, dual outputs, and an auxiliary lubrication pump.

The CRT 7033-5: nonloader version with dropbox, dual outputs, and without an auxiliary lubrication pump.

RATINGS

General Rating

Max. input speed, rpm:	2500 rpm	
Max. net input torque:	1742 N·m	1285 lb ft*
Max. net input power:	328 kW	440 hp*
Max. turbine torque:	4157 N·m	3066 lb ft

* Net as installed: inlet restriction, exhaust restriction, alternator, fan, idle steer pump, idle implement pump, and air compressor should be deducted when applicable.

Rating Chart Reference

CRT 7033: TC-19086

Torque Converter

The CRT 7033 transmission provides a single stage, three-element hydraulic torque converter. The available converter models for each series and the stall ratio for each model is listed below.

CRT 7033 Converters

Converter Model	Absorption Chart No.	Stall Ratio
TC 540	TC 9746	2.64:1
TC 550	TC 9747	3.32:1
TC 580	TC 9750	2.81:1
FTC 540	TC 11928	2.95:1
FTC 550	TC 12822	3.20:1
FTC 580	TC-12825	2.67:1

Control Valve Body Assembly

A mechanically-actuated, hydraulic control valve body is used to provide a powershift range selection. Manipulation of a directional-spool valve and a range-spool valve provide the 3-forward and 3-reverse ranges according to operator requirements. Forward low and reverse low are trimmed to provide a full-throttle and/or full-speed directional shifting capability. Optional valve bodies are available for hydraulic or pneumatic clutch cut-off features.

Gearing

Gear Data

Range gearing:	constant-mesh planetary
Transfer gearing:	constant-mesh inline
Gear type:	spur

Gear Ratios

1.000:1 Dropbox

	Low	Intermediate	High
F:	3.040:1	1.67:1	1.00:1
R:	2.530:1	1.38:1	.83:1

1.300:1 Dropbox

F:	3.952:1	2.170:1	1.300:1
R:	3.290:1	1.790:1	1.079:1

NOTE: To obtain overall transmission torque ratios, multiply the applicable torque converter ratio times the overall gear ratio.

Mounting

Direct

CRT 7033, front adaptation: SAE #1, wet-type converter housing. Crankshaft-piloted flexdrive with converter flywheel. Ring gear drive also available. Adaptation depends on the engine model.

Side pads: Six .625-11 tapped holes are on each side. Cradle mounting, between transmission side pads and engine flywheel housing pads, is required for either model.

Remote

Input: A three-point mount is required. The front is trunnion mounted. Input flange for shaft is required and available.

Side pads: Mounts from both side pads are required with trunnion mount.

Output Configuration

The CRT 7033-3, CRT 7033-5 have two output locations available 469.9 mm (18.5 in.) below the input. The input and output shaft rotation for these models as viewed from the input (in forward range) are indicated below:

CRT 7033-3 Input, clockwise; output, clockwise

CRT 7033-5 Input, clockwise, output, clockwise

Clutch Data

Type: Multidisc, hydraulically-actuated, spring-released, oil-cooled, automatically wear compensating.

Speedometer Drive**

Availability: With 1.00:1 ratio dropbox only

Type: SAE 5/32 heavy duty

Location: Rear cover, refer to basic installation drawing

Shaft speed: Equal to output speed

Rotation: Opposite output rotation

** Parts are available, but assembly is not production released.

Transmission Breather

A transmission breather is supplied with the transmission as standard equipment.

Parking Brake

Availability: Optional on dual output models only at the rear output "D" position.

Description: 305 × 127 mm (12 × 5 in) internal expandable shoe.

Rating: Maximum intermittent rating, burnished***, 10,169 N·m (90,000 lb-in.) at 2225 N (500 lb) apply force. Continuous design rating is 75 percent of maximum rating.

*** Brakes are shipped unburnished. Unburnished capacity is only 35 percent of rated capacity.

SPECIFICATIONS

Weight, Dry, Approximate

CRT 7033-3,-5:	1227-1250 kg (2700-2750 lb) depending upon model, options.

Oil System

Oil Capacity. less external circuits.

Initial fill:	49.2 liters (13.00 U.S. gal.)
Refill:	42.6 liters (11.25 U.S. gal.)

Oil Filter. Ref: AS 56-021

Either remote-mounted filters supplied by the customer or integral dual full-flow oil filters are optional.

Oil Type: Hydraulic transmission fluid, C-3.

Oil Pump: Input driven, positive displacement, gear type.

Main Oil Pressure: At full throttle: 896-965 kPa (130-140 psi).

Oil Temperature: Max. converter out, continuous, 135°C (275°F).

Power Take-off Provisions

Gear-drive PTO, lower-right side.

Ratio:	1.000 × engine speed
Rating:	
Max. intermittent power, 2100-2500 rpm:	150 kW 200 hp
Max. continuous power, 2100-2500 rpm:	95 kW 125 hp
Mounting pad:	SAE 8-bolt heavy duty
Gear spec:	6 pitch, 46 teeth.

Accessory-drive PTO shaft, rear of converter housing (not available with CRT 7033-3 models).

Ratio:	1.000 × engine speed
Rating:*	
Max. intermittent power, 2100-2500 rpm:	150 kW 200 hp
Max. continuous power, 2100-2500 rpm:	95 kW 125 hp
Mounting pad:	SAE C 4-bolt
Shaft spline:	SAE C.

II. TRANSMISSION RATING CHARTS

Each transmission rating chart is expressed in metric power (kW) on one side and U.S. horsepower (HP) on the other side. The rating charts are compatible with net engine power corrected to the SAE J1349 Engine Test Code.

The following information may be helpful for interpreting and adjusting engine data for use with the rating charts.

SAE J1349 ENGINE TEST CODE BASELINE

Condition	Metric	U.S.
Pressure-Total	100 KPa	29.61 in Hg
Temperature	25°C	77° F
Vapor Pressure	1.0 KPa	.2961 in Hg
Dry Baro Pressure	99 KPa	29.31 in Hg
Dry Air Density	1.157 Kg/m^3	.0722 lb/ft^3
Fuel Temperature	40 ± 3°C	104 ± 5.4°F

ENGINE POWER & TORQUE CONVERSION FORMULAES

US --- United States Customary
SI --- International System of Units (New Metric)
NSI --- Centimetre, Gram, Second System (Old Metric)

	UNITS		
	US	SI	NSI
TORQUE	LB.FT.	N-m	TORQUE (m)
POWER	HP	KW	HP (m)

Torque (m)
Metre-Kilogram Symbols
mk·p
kg·m
mkg
kgm

HP (m)
Metric Horsepower Symbols
PS (Pferde Stärke)
CV (Cheval - Vapeur)
hk (häst kraft)
pk (paarde kracht)

LB.FT. - Torque (m) X 7.233
HP = HP (m) X 0.9863

$HP = \frac{\text{Torque (m) X r/min}}{726}$

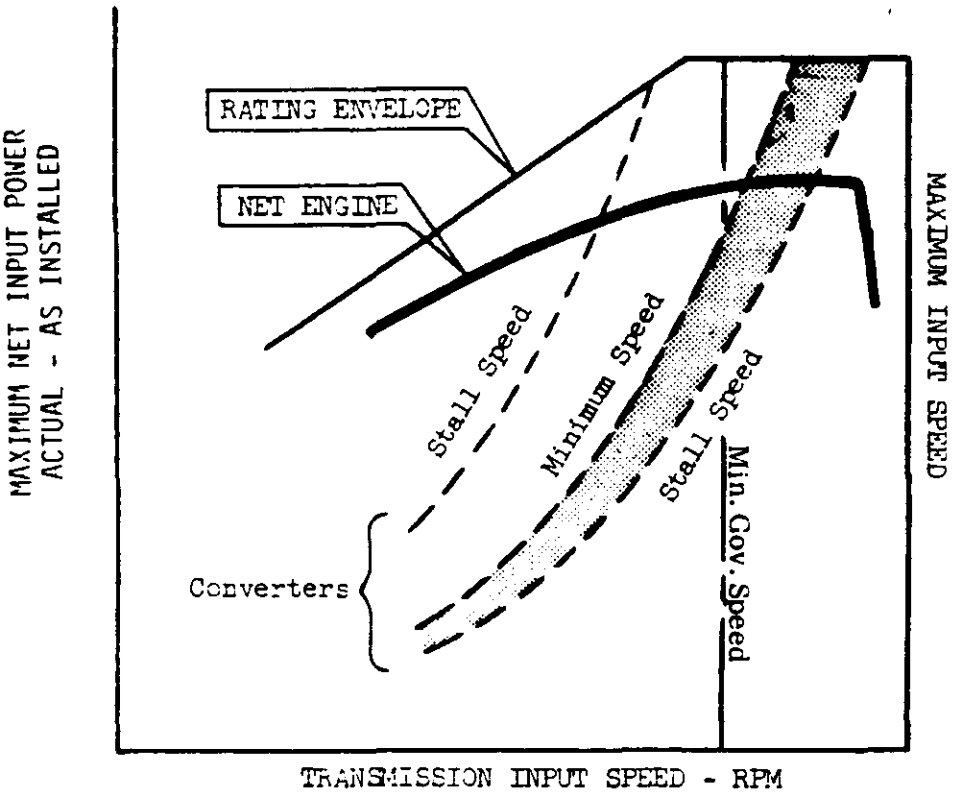
$HP = \frac{\text{LB.FT. X r/min}}{5252}$

N·m = Torque (m) X 9.807
kW = HP (m) X 0.7355

$kW = \frac{\text{Torque (m) X r/min}}{974}$

$kW = \frac{\text{N·m X r/min}}{9549}$

TYPICAL RATING CHART



A typical rating chart consists of a solid line envelope expressed in terms of power and speed, and a series of dotted lines each representing the capacity characteristics of the converters used in the transmission. In some instances, because of the converter's speed characteristics, the converter is defined by a band shown by dual dotted curves in which case the first line of the band represents the minimum speed characteristics and the second line the stall speed.

All rating charts carry a maximum input (governed) speed rating, whereas only a few have a minimum governed speed limit. In these cases, the full load governed speed of the engine must fall on or above the minimum governed speed line but cannot exceed the maximum input speed rating.

To determine whether a given engine is within the rating of a converter and transmission, the net engine curve must be plotted on the rating chart as follows:

- Correct gross engine to SAE J1349 baseline and deduct engine accessories.
- Plot this net engine power curve (corrected power less accessories) on converter or transmission rating chart.
- Investigate converter and lockup operation in the following manner after selecting proper converter.

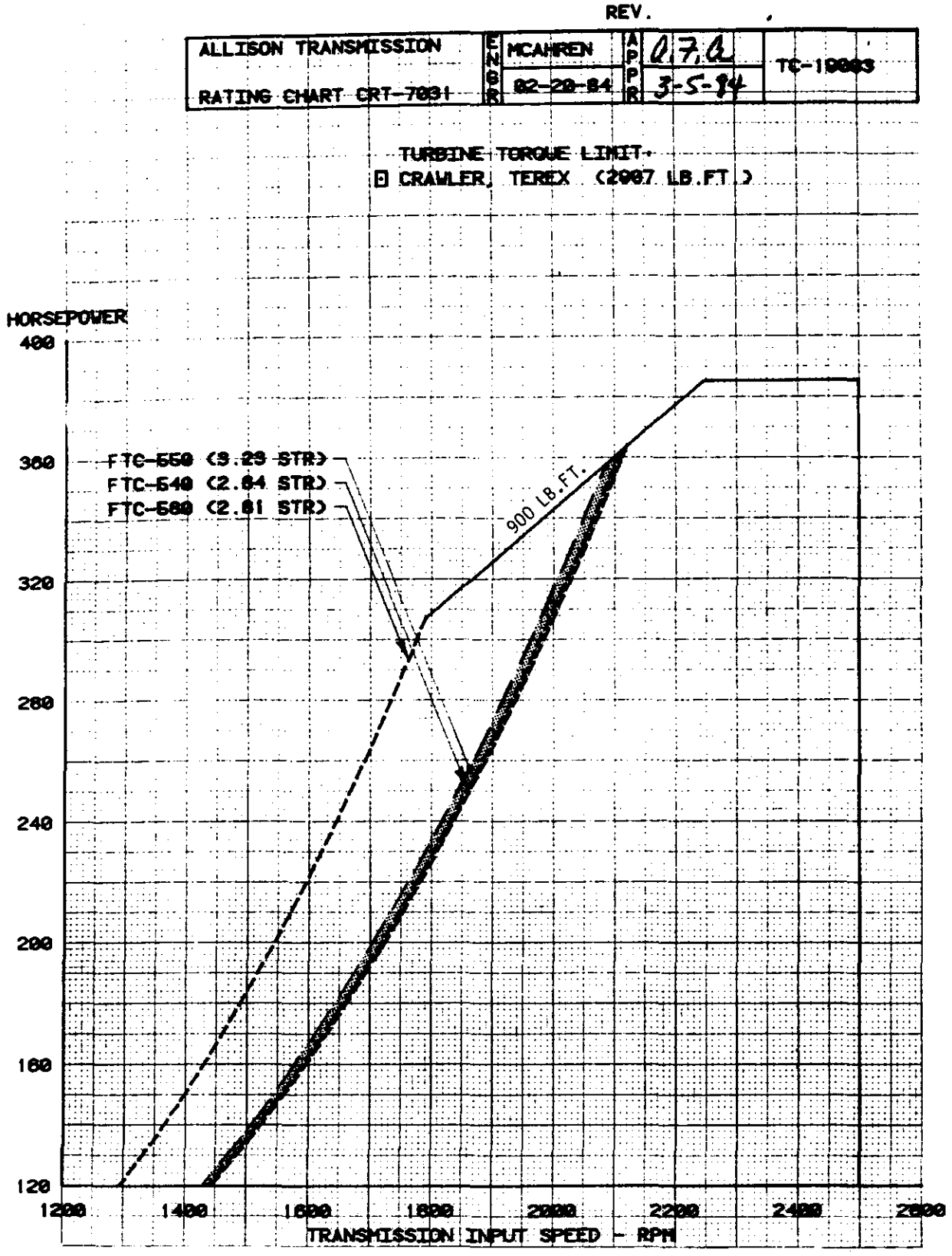
CONVERTER OPERATION (All Transmissions)

The net engine power curve must intersect the converter stall line within the envelope as defined by the solid line envelope.

If the converter speed characteristics are represented by a band (shaded area), the power curve of the engine must intersect both lines of the converter within the rating envelope.

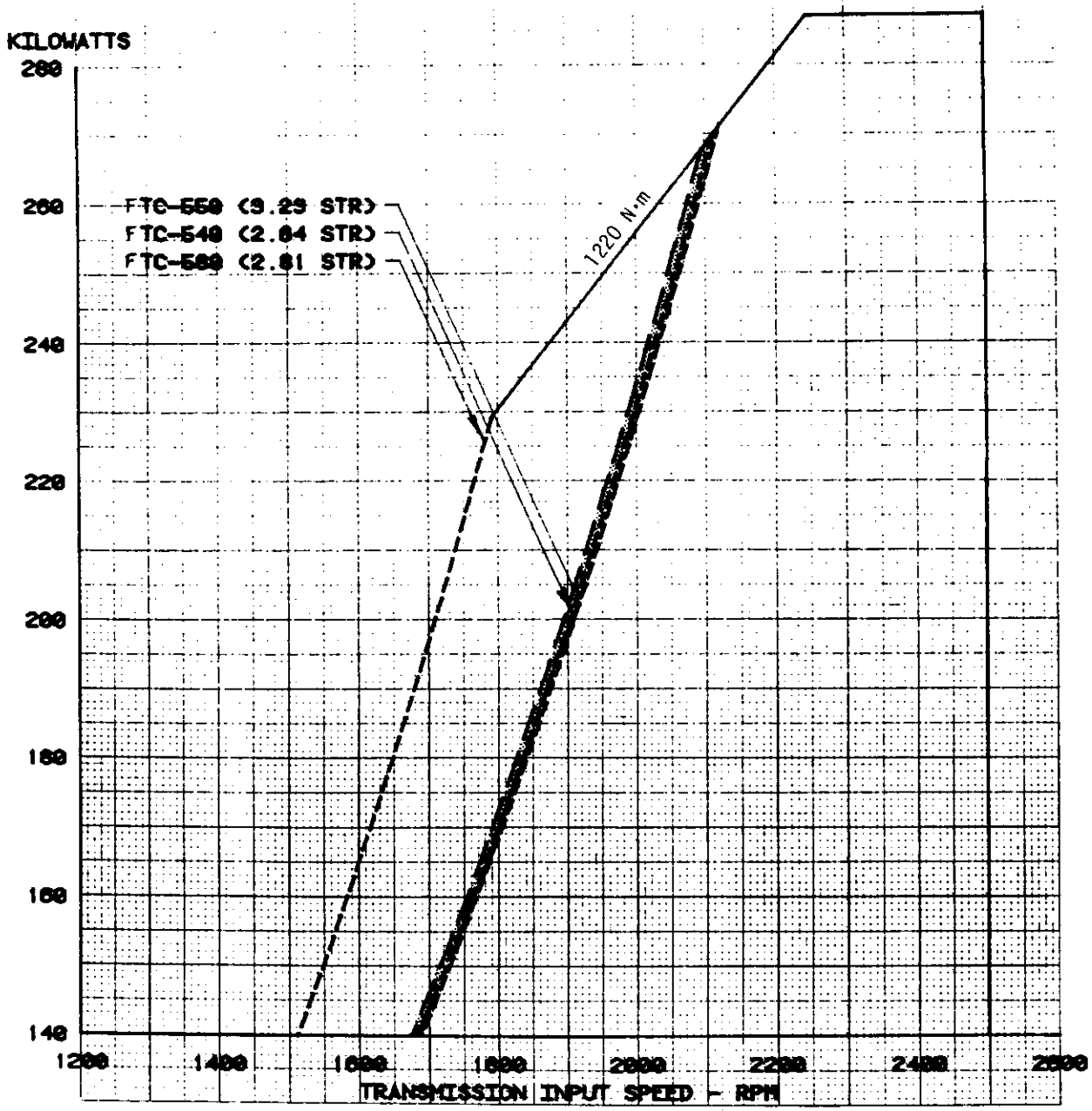
LOCKUP OPERATION (Transmissions with Lockup)

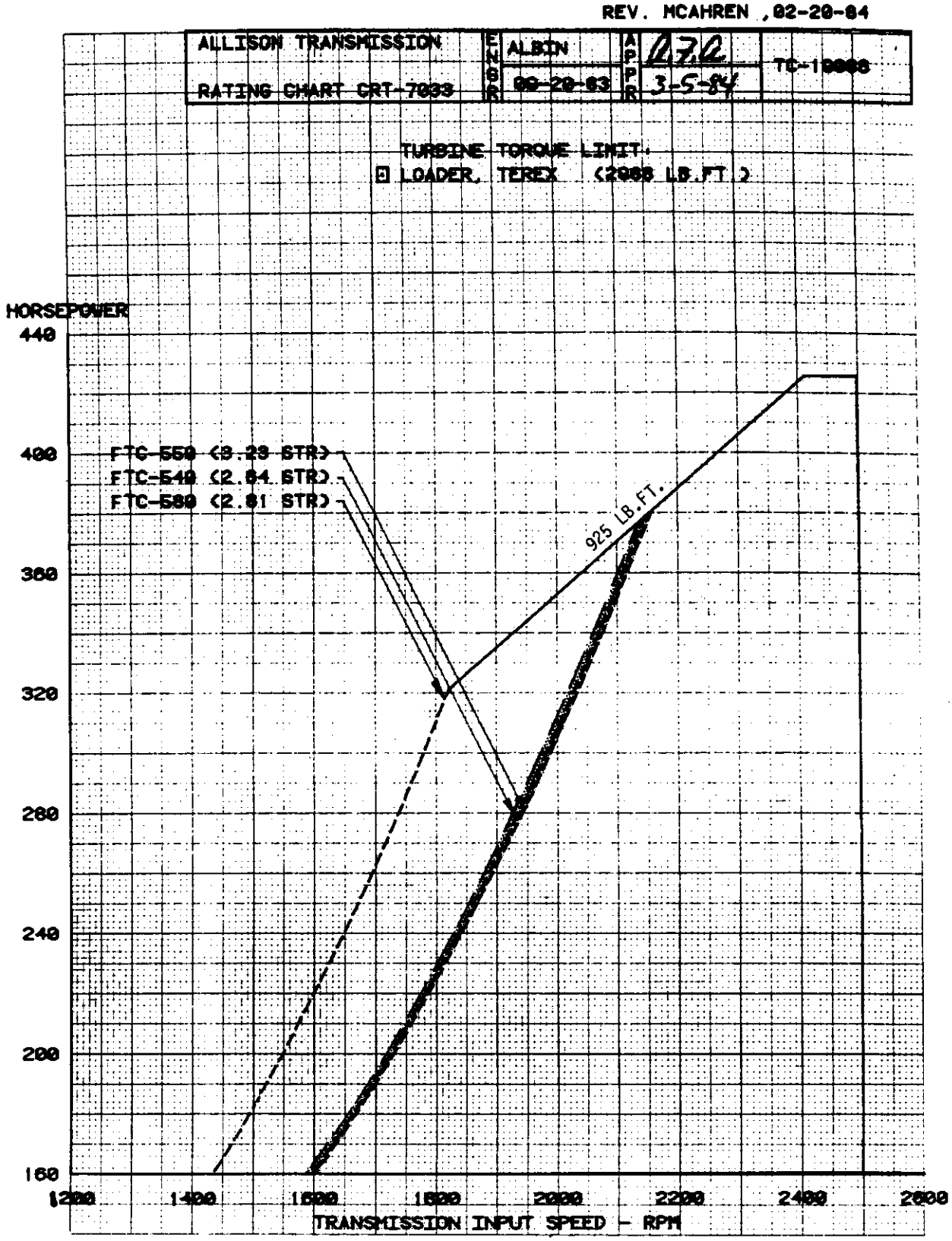
The engine power curve must fall below the solid-line envelope for all speeds defined by the rating envelope.


REV.
ALLISON TRANSMISSION
RATING CHART CRT-7031
ENGR MCAHREN 02-20-84
APPR 0,7,a 3-5-84
TC-19003
TURBINE TORQUE LIMIT-
CRAWLER, TEREX (2907 LB.FT.)
HORSEPOWER
400
360
320
280
240
200
160
120
FTC-550 (3.29 STR)
FTC-540 (2.84 STR)
FTC-580 (2.61 STR)
900 LB.FT.
1200
1400
1600
1800
2000
2200
2400
2600
TRANSMISSION INPUT SPEED - RPM

REV.				
ALLISON TRANSMISSION	ENGR MCAHREN	APPR 2.7.a	TC-19003
RATING CHART CRT-7091	ENGR 02-20-84	APPR 3-5-84	

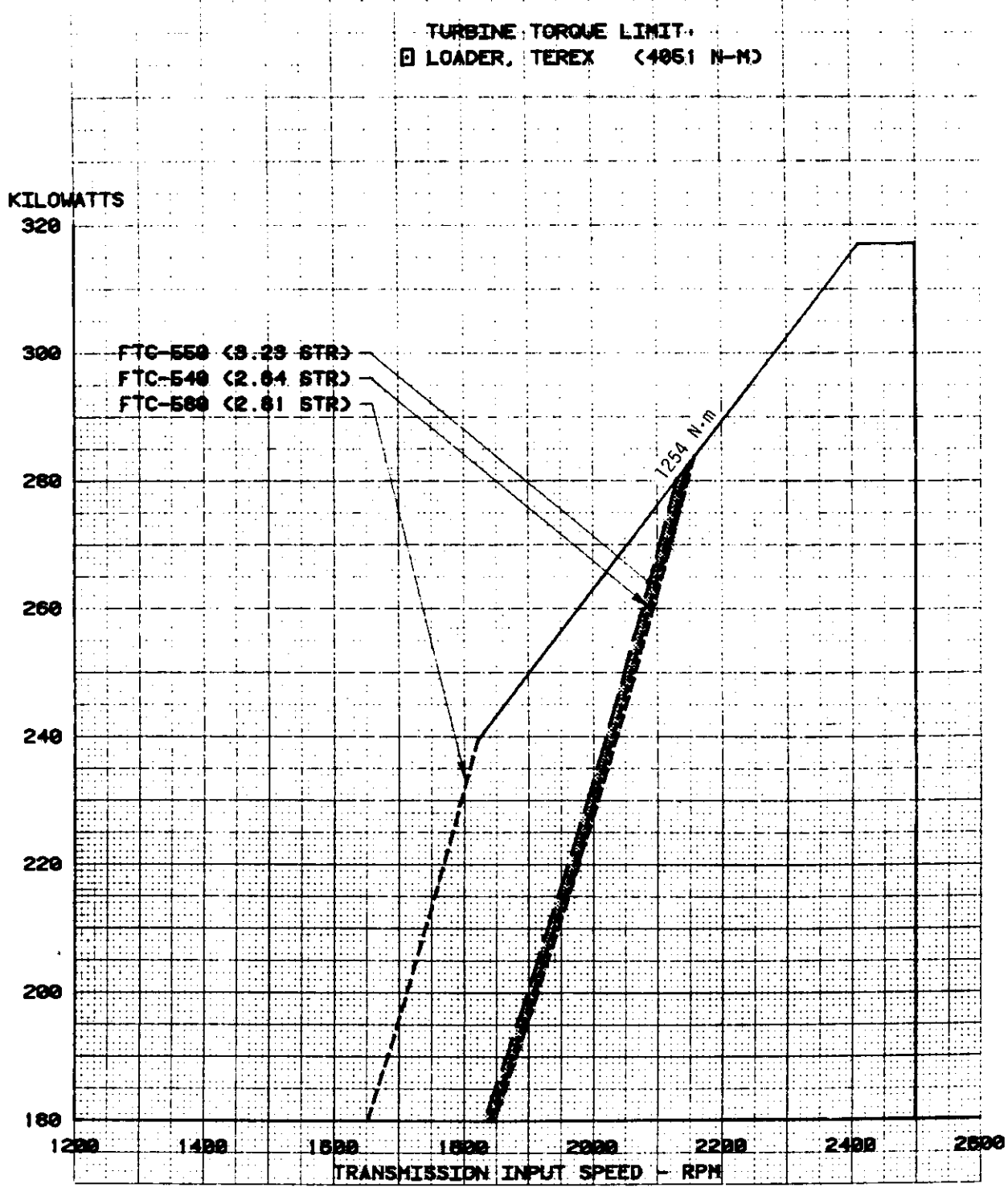
TURBINE TORQUE LIMIT:
☐ CRAWLER, TEREX (3941 N-M)




REV. MCAHREN ,02-20-84
ALLISON TRANSMISSION
RATING CHART CRT-7033
ENGR ALBIN 02-20-83
APPR 3-5-84
TC-19068
TURBINE TORQUE LIMIT:
LOADER, TEREX (2068 LB.FT.)
HORSEPOWER
440
400
360
320
280
240
200
160
FTC-550 (3.23 STR)
FTC-540 (2.64 STR)
FTC-580 (2.81 STR)
925 LB.FT.
1200
1400
1600
1800
2000
2200
2400
2600
TRANSMISSION INPUT SPEED - RPM

REV. MCAHREN ,02-20-84

ALLISON TRANSMISSION	ENGR	ALBIN	APPR	A.T.A.	TC-19086
RATING CHART CRT-7033		09-20-83		3-5-84	



III. SUPPORT EQUIPMENT

This section describes the required support equipment for the cycling transmissions and lists the suppliers of these items. The reliability and warranty coverage of these components are the responsibility of the supplier. Components from sources other than DDA have been evaluated only for functional compatibility with the DDA product.

This will be revised as additional information becomes available.

Engine Adaptation Pieces

DDA Adaptation Drawings describe the physical adaptations of our transmissions with the various engines manufactured.

Input and Output Yokes and Flanges: (Ref. AS 58-035)

Yokes and flanges can be purchased with the transmission as a specified option or directly from the flange manufacturer.

Borg Warner
Mechanics Division
2020 Harrison Avenue
Rockford, IL 61101
Phone: (815) 398-3000

Dana Corporation
Heavy Duty Marketing Division
P.O. Box 321
Toledo, OH 43691
Phone: (419) 866-1841

Twin Disc, Inc.
1340 Racine Street
Racine, WI 53403
Phone: (414) 634-1981

Shift Controls: (Ref. AS 56-031, AS 56-032)

American Standard
Wabco Fluid Power Division
1953 Mercer Road
Lexington, KY 40505
Phone: (606) 254-8031

Bennett Enterprises, Inc.
2649 Manana Drive
Dallas, TX 75220
Phone: (214) 351-9991

Weatherhead Company
Williams Air Control Division
14100 S.W. 72nd Avenue
Portland, OR 97223
Phone: (503) 639-3151

Clutch Cut-off Controls: (Ref. AS 56-019)

An air-actuated clutch cut-off feature is available as an option. A small air actuator is required to control the clutch cut-off feature.

Air Mite Devices, Inc.
4739 W. Montrose Avenue
Chicago, IL 60641
Phone: (312) 286-3393

Speedometer Drive: (Ref. AS 56-031, AS 56-032)

Cycling transmissions use an SAE 5/32 heavy-duty drive.

Temperature and Pressure Gages.

Temperature and pressure gauges are available with properly identified operating bands as shown on AS 00-045. The temperature gauge is a capillary type with three different capillary lengths available. These gages may be ordered from DDA Service Parts:

Temperature Gage Part No.	Capillary Length	
23010422	3.20-3.35 m	10'6"-11'0"
23010423	1.83-1.98 m	6'0"-6'6"
23010424	1.22-1.37 m	4'0"-4'6"

Pressure Gage: See AS 00-045

Neutral Start Switch

The neutral start function is not a part of the CRT 7033 transmission assembly.

Power Take-offs: (Ref. AS 56-031, AS 56-032)

PTO manufacturers listed below:

Dana Corporation
Power Equipment Division
P.O. Box 550
Chelsea, MI 48118
Phone: (313) 475-8641

Sperry Vickers Corporation
Tulsa Products Division
P.O. Box 6
Tulsa, OK 74115
Phone: (918) 836-3771

Heat Exchangers: (Ref. AS 00-022)

Heat exchanger manufacturers listed below:

Oil to Water

American Standard
Heat Transfer Division
P.O. Box 1102
Buffalo, NY 14240
Phone: (716) 897-2800

Perfex Group
500 W. Oklahoma
Milwaukee, WI 53207
Phone: (414) 744-1000

Heatex, Ltd.
2225 Lapierre St.
LaSalle 660, Quebec, Canada
Phone: (514) 365-6100

G & O Manufacturing Co.
138 Winchester Avenue
New Haven, CT 06508
Phone: (203) 562-5121

Harrison Radiator Division, GM
200 Upper Mountain Road
Lockport, NY 14094
Phone: (716) 439-3066

Stewart-Warner Corporation
Southwind Division
1514 Drover Street
Indianapolis, IN 46221
Phone: (317) 682-8411

Modine Manufacturing Co.
1500 DeKoven Avenue
Racine, WI 53401
Phone: (414) 633-2411

Sen-Dure Products, Inc.
Bay Shore, NY 11707
Phone: (516) 665-0689

Young Radiator Co.
2825 Four Mile Rd.
Racine, WI 53404
Phone: (414) 639-1010

Oil to Air

Dunham Bush, Inc.
Riverside Division
1850 Massachusetts Avenue
Riverside, CA 92507
Phone: (714) 684-0991

Hayden Inc.
1531 Pomona Road
Corona, CA 91720
Phone: (714) 735-4900

Karmazin
3776 Eleventh Street
Wyandotte, MI 48192
Phone: (313) 282-3776

External Main Circuit Oil Filters: (Ref. AS 56-021)

Specifications for filters are shown on respective AS drawings and the filter manufacturers are listed below:

AC Spark Plug Division GM
1300 N. Dart Highway
Flint, MI 48556
Phone: (313) 766-5000

Schroeder Corporation
101 Nichol Avenue
McKees Rock, PA 15136
Phone: (412) 771-4810

Parking Brake: (Ref. AS 56-031, AS 56-032)

A parking brake is available as an option with the transmission or may be purchased separately from the brake manufacturer.

Bendix
Automotive Controls Systems Group
401 North Bendix Drive
South Bend, IN 46634
Phone: (219) 237-2100

Rockwell International
Aftermarket Sales, Brakes
Troy, MI 48084
Phone: (313) 435-1382
(For nearest Rockwell Brake
Distributor)

Auxiliary Heater

Auxiliary heaters can be adapted to the cycling transmissions.

Kim Hotstart Mfg. Co.
East 5724 Broadway, Box 42
Spokane, WA 99210
Phone: (509) 534-6171

General Electric (Calrod)
Industrial Heating Products
One Progress Road
Shelbyville, IN 46176
Attn: Sales Manager
Phone: (317) 398-4411

Phillips Manufacturing Co.
8200 Grand Avenue, South
Minneapolis, MN. 55420
Phone: (612) 888-4105

Dipstick and Filltube: (Ref. AS 56-031, AS 56-032)

Reference the Installation Manual for venting requirements. Contacts for special dipstick and filltube designers are listed below:

Estan Manufacturing Company
32053 Howard
Madison Heights, MI 48071
Phone: (313) 588-1137

Moeller Manufacturing Company
Greenville, MS 38701
Phone: (601) 335-2326

IV. INSTALLATION DRAWINGS

The Detroit Diesel Allison Application Specification (AS) drawings for the CRT series transmissions have been revised and updated to include the latest available information.

The CRT series transmissions are represented by the following basic installation drawings:

Transmission Model	Basic Drawing Number
CRT 7033-3	AS 56-031
CRT 7033-5	AS 56-032

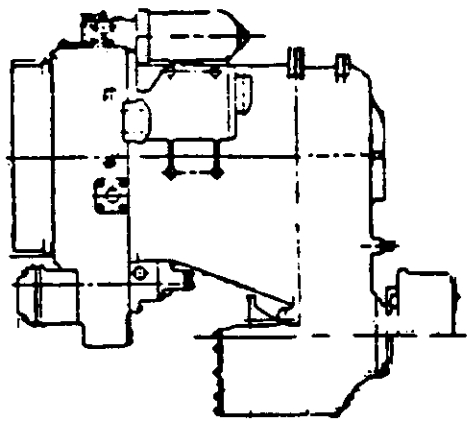
Figure 1 shows the major profile differences of the various CRT models.

Table 1 lists all the CRT series AS installation drawings. The title of the drawing and code of applicable transmission model is referenced.

Table 2 lists all CRT physical adaptation drawings which are designated AS 04-xxx drawings. The engine manufacturer and engine model is indicated for each application.

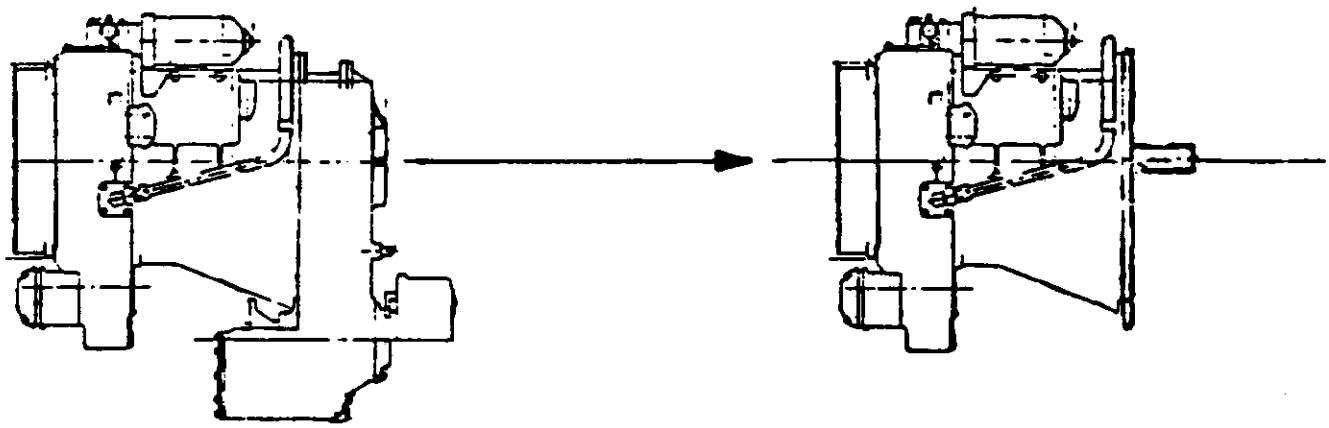
New drawings are created with SI Metric units. Earlier drawings using English units are being converted as the drawings come up for revision, following the trend to universal measurements.

CRT 5633-3, CRT 7033-3
LOADER VERSION



CRT 5633-5, CRT 7033-5
NONLOADER VERSION

CRT 5633-7
STUBSHAFT VERSION



CRT 5643-2

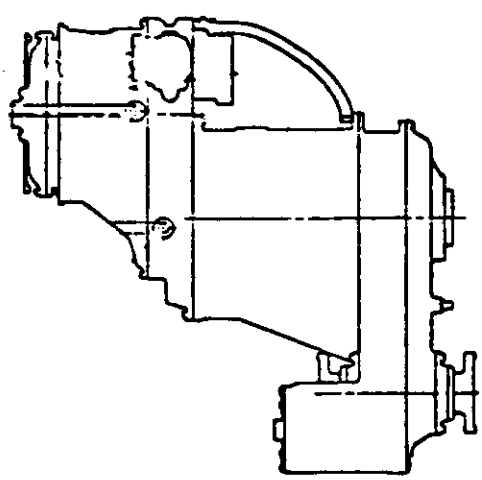


Figure 1 CRT Basic Model Profiles

Table 1 CRT 7000 Series Installation Drawings

Drawing Number	Drawing Title	Applicable Model Codes E=CRT 7033-3 Loader F=CRT 7033-5 Nonloader Applicable Model Codes
AS 00-001	Transmission Drive Adaptation Chart	E, F
AS 00-002	Engine/Transmission Adaptation Requirements	E, F
AS 00-003	Transmission Trunnion Support	E, F
AS 00-045	Off-highway Transmission Gauges	E, F
AS 56-005	Side PTO Option	E, F
AS 56-007	Implement Pump Drive Option	E, F
AS 56-018	Auxiliary Lube Circuit	E
AS 56-019	Air-actuated Clutch Cutoff	E, F
AS 56-020	Hydraulic Clutch Cutoff	E, F
AS 56-021	External Hydraulic Circuit	E, F
AS 56-022	CRT 5633 Cooler Flow Data	E, F
AS 56-031	Basic Installation Drawing	E
AS 56-032	Basic Installation Drawing	F
AS 58-035	Drive Flange Data	E, F

Table 2 CRT 7000 Adaptation Drawings

Drawings Number	Engine Manufacturer	Engine Models
AS 04-024	CUMMINS	NH Inline Models (855 cu in.)
AS 04-025	DETROIT DIESEL	71 Series
AS 04-036	DETROIT DIESEL	6-110
AS 04-038	CUMMINS	VT12, NVK-450, V12-525, VT12-635, VT12-700 Phase I
AS 04-051	CATERPILLAR	1673, D-333
AS 04-055	CATERPILLAR	D-343
AS 04-065	DEUTZ	F12L-714
AS 04-094	DEUTZ	F8L-714
AS 04-110	CUMMINS	V1710, VT1710, VTA1710 Phase III
AS 04-118	CATERPILLAR	D346-E231
AS 04-164	CUMMINS	K Series
AS 04-165	DETROIT DIESEL	92 Series
AS 04-196	CATERPILLAR	3406, 3408 (SAE #1 HSG)
AS 04-197	CATERPILLAR	3412 (SAE #0 HSG)

REFERENCES

Manuals

SA 1547	CRT Series	Service Manual	Available Late 1984
SA 1559	CRT Series	Parts Catalog	
SA 1355	CRT Series	Operators Manual	

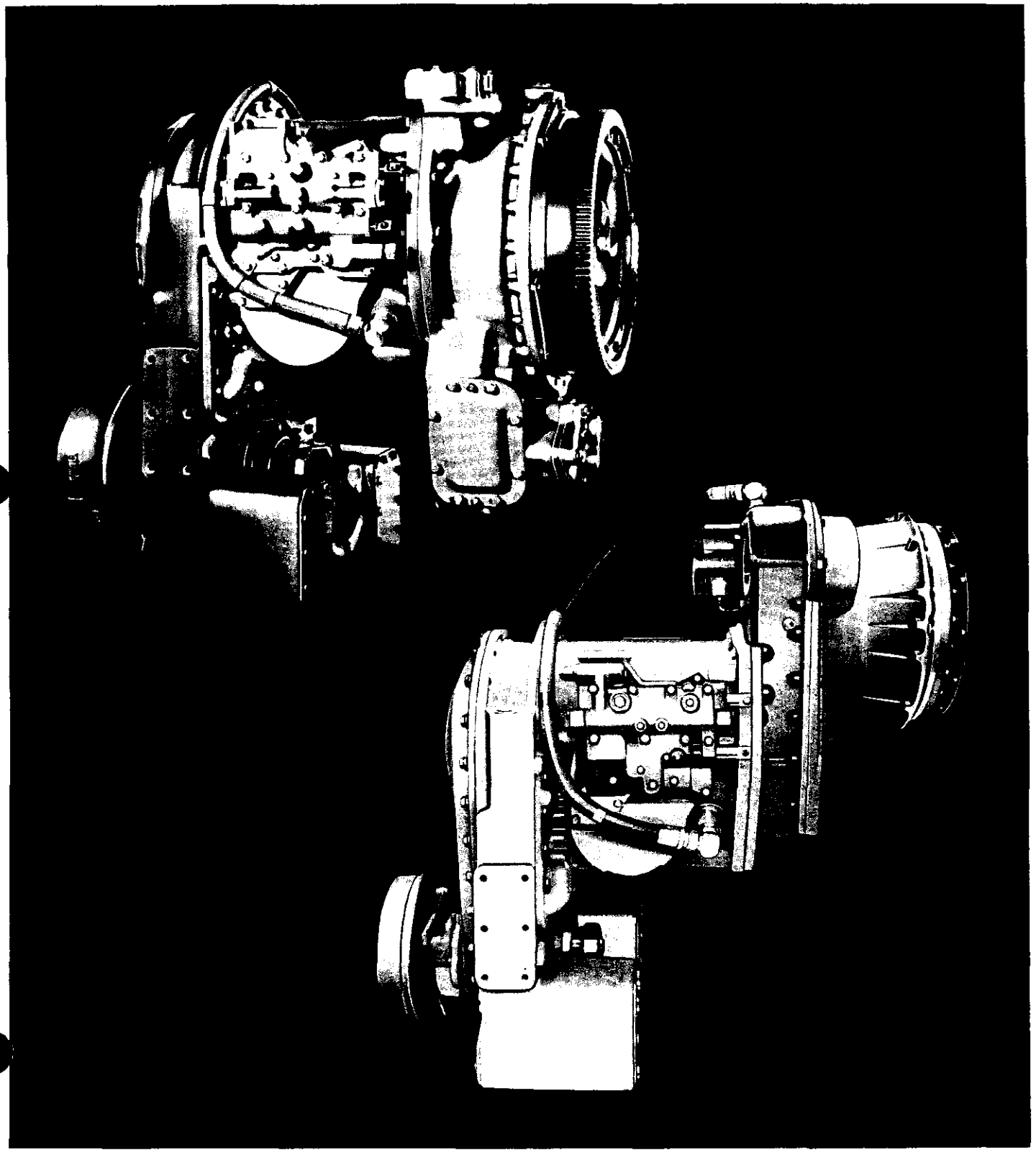
Prepared and distributed by Sales Development, J5, Detroit Diesel Allison, P.O. Box 894, Indianapolis, IN 46206.

Allison Transmissions

cycling models

CRT 5000 Series
CRT 7000 Series

up to 440 NHP (328 kW)

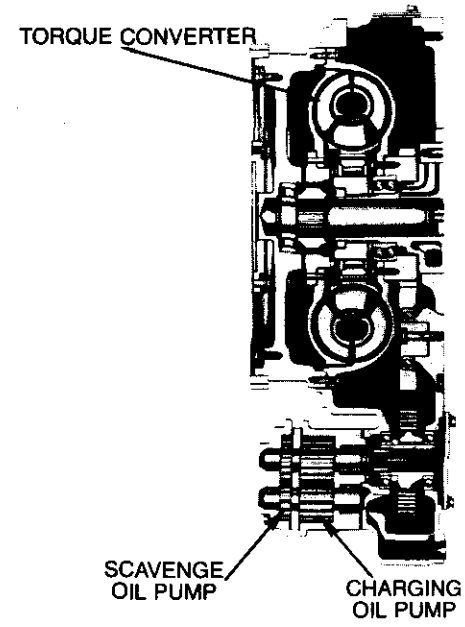


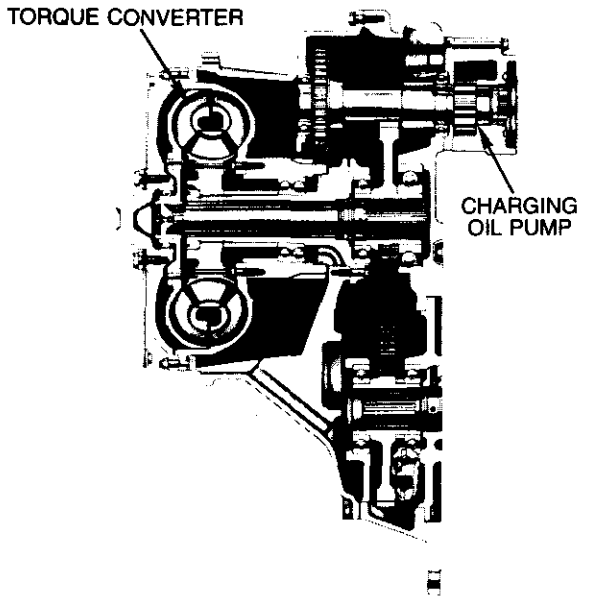
specifications

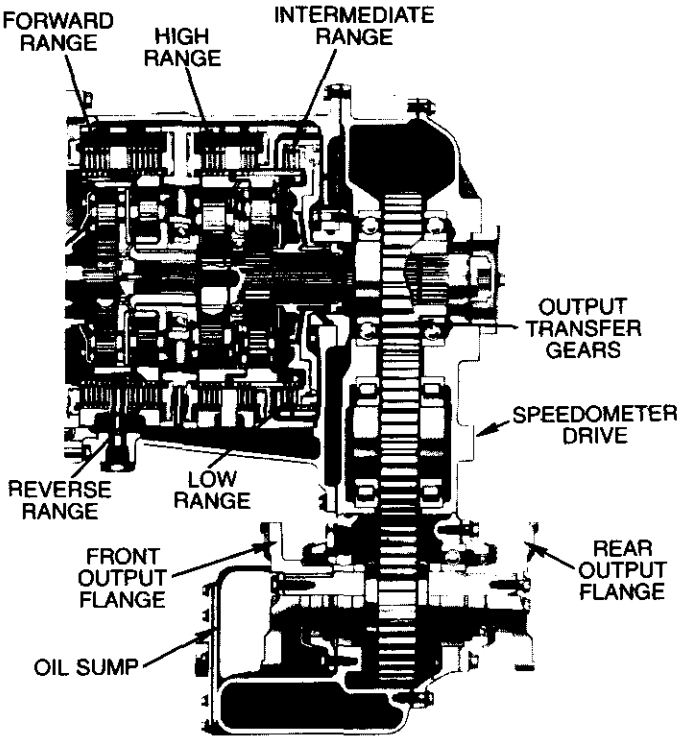
		CRT 5633	CRT 5643	CRT 7033
rating	Input power, max. net Input torque, max. net Input speed, max.	General rating: 430 hp (320 kW) 900 lb ft (1220 N•m) 2500 rpm		440 hp (328 kW) 1285 lb ft (1742 N•m) 2500 rpm
rotation	Input (viewed from input) Output (viewed from input)	Right hand Right hand (forward range)	Right hand Left hand (forward range)	Right hand Left hand (forward range)
speeds	Forward Reverse	3 3	3 3	3 3
mounting	Direct	SAE #1 wet type converter housing. Crankshaft piloted flexdrive with converter flywheel. Ring gear drive optional.	Modified SAE #2 wet type converter housing with flexplate drive bolted to flywheel and converter hub piloted into flywheel.	SAE #1 wet type converter housing. Crankshaft piloted flexdrive with converter flywheel. Ring gear drive optional.
		(6) .625-11 tapped holes on each side pad. Cradle mounting between side pads and engine flywheel housing pads required.		
	Remote	(3) point mount required. Front trunnion mounted. Input flange required.	Available upon Request	(3) point mount required. Front trunnion mounted. Input flange required.
		Mounts from both side pads required with trunnion mount.		Mounts from both side pads required with trunnion mount.
torque converter	Type	Single stage, three-element, hydraulic		
	Stall torque ratios	TC 430-3.59:1 TC 570-3.04:1 TC 530-3.48:1 TC 580-2.81:1 TC 540-2.64:1 FTC 430-3.56:1 TC 550-3.23:1 FTC 450-3.32:1	FTC 476-3.68:1 *Other converters available upon request.	TC 540-2.64:1 FTC 540-2.95:1 TC 550-3.23:1 FTC 550-3.20:1 TC 580-2.81:1 FTC 580-2.67:1
gearing	Type Range gears Transfer gears	Constant mesh, spur, planetary Constant mesh, spur, in-line		
	Ratios (Does not include torque converter ratio)	1.000:1 drop box & straight through	1.300:1 dropbox	1.000:1 dropbox & straight through / 1.300:1 dropbox
		Forward / Reverse	Forward / Reverse	Fwd / Rev / Fwd / Rev
	Low	3.040:1 / 3.162:1	3.952:1 / 4.111:1	3.040:1 / 2.530:1 / 3.952:1 / 3.290:1
	Intermediate	1.510:1 / 1.570:1	1.963:1 / 2.041:1	1.67:1 / 1.38:1 / 2.170:1 / 1.790:1
	High	.760:1 / .790:1	.988:1 / 1.027:1	1.00:1 / .83:1 / 1.300:1 / 1.079:1
clutches		Hydraulically-actuated, spring released, oil cooled, multidisk and automatically wear compensating		
parking brake (optional)	Type Size Rating	Internal expandable shoe 12 in x 5 in (305 x 127 mm) Max. intermittent, burnished 90,000 lb in(10,169 N•m) @ 500 lbs (2225 N) apply force. Brake supplied unburnished		
power takeoff	Rating	Gear drive PTO 200 hp (149 kW) max. intermittent power @ 2100-2500 rpm 125 hp (95 kW) max. continuous power @ 2100-2500 rpm	Implement drive PTO 200 hp (149 kW) max. intermittent power @ 2000-2500 rpm 150 hp (112 kW) max. continuous power @ 2000-2500 rpm	Gear drive PTO 200 hp (149 kW) max. intermittent power @ 2100-2500 rpm 125 hp (95 kW) max. continuous power @ 2100-2500 rpm
	Mounting pad	SAE 8 bolt heavy duty	SAE C 2/4 bolt	SAE 8 bolt heavy duty
	Gear specification	6 pitch, 46 teeth	—	6 pitch, 46 teeth
	Spline size	—	SAE C	—
	Ratio	1.00 x engine speed	1.00 x engine speed	1.00 x engine speed
	Rating	Accessory drive PTO shaft 200 hp (149 kW) max. intermittent power @ 2100-2500 rpm 125 hp (95 kW) max. continuous power @ 2100-2500 rpm	Accessory drive PTO 200 hp (149 kW) max. intermittent power @ 2000-2500 rpm 150 hp (112 kW) max. continuous power @ 2000-2500 rpm	Accessory drive PTO shaft 200 hp (149 kW) max. intermittent power @ 2100-2500 rpm 125 hp (95 kW) max. continuous power @ 2100-2500 rpm
	Mounting pad	SAE C 4 bolt	SAE C 2/4 bolt	SAE C 4 bolt
	Spline size	SAE C	SAE C	SAE C
	Ratio	1.00 x engine speed Note: 200 hp (149 kW) max. intermittent; 125 hp (95 kW) max. continuous; combined rating for both pads	1.00 x engine speed Note: 250 hp (186 kW) max. combined rating for both pads	1.00 x engine speed Note: 200 hp (149 kW) max. intermittent; 125 hp (95 kW) max. continuous; combined rating for both pads
	Rating	Emergency Steer PTO Available upon request	Emergency Steer PTO 191 hp (143 kW) max. continuous power @ 2000-2500 rpm	Emergency Steer PTO Available upon request
	Mounting pad		SAE B 2 bolt	
	Spline size		SAE B	
	Ratio		1.00 x output speed	
control valve body	2-spool external control	Customer supplied mechanical, hydraulic or pneumatic linkage		
oil system	Oil type Filter	Hydraulic transmission fluid, Type C-3 Customer furnished, remote mounted (or DDA furnished integral dual full flow optional on CRT 5633 and CRT 7033)		
size	Length, max. approx	49.6 in (1259.8 mm)	43.0 in (1092.2 mm)	52.0 in (1320.8 mm)
	Width, max. approx	30.6 in (777.2 mm)	28.5 in (723.9 mm)	28.1 in (713.7 mm)
	Height, max. approx	41.9 in (1064.3 mm)	47.6 in (1209.0 mm)	41.9 in (1064.3 mm)
	Weight, max. approx	2500 lbs. (1134 kg)	2495 lbs. (1132 kg)	2750 lbs. (1247 kg)

Note: All data and specifications subject to change without notice.

CRT series cycling transmissions





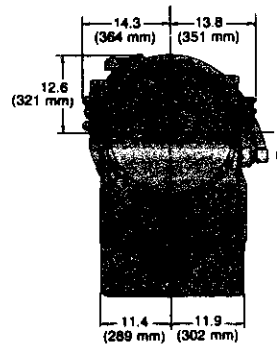


CRT transmissions pioneered powershift cycling operations, setting the standard for speed, productivity, and long-life reliability. They are applicable in compactors, material handling units, log loaders, rubber tire tractors, shovel loaders, mining equipment, winches and hoists, crawler tractors, and many other types of cycling equipment up to 465 gross HP.

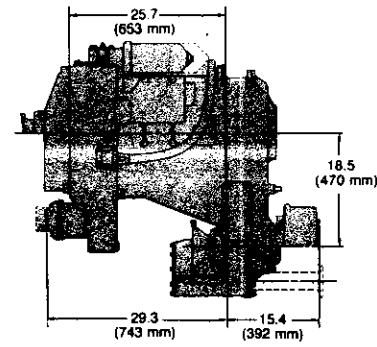
The CRT transmissions offer an impressive array of advantages, including faster hydraulic action, increased torque capacity, longer brake life, and reduced cycle time.

mounting dimensions

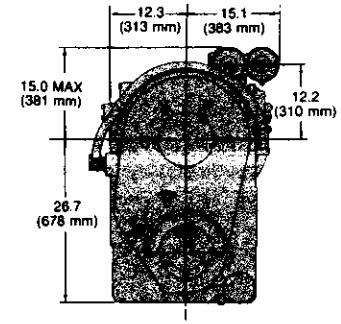
CRT 5633—NON LOADER VERSION



FRONT VIEW

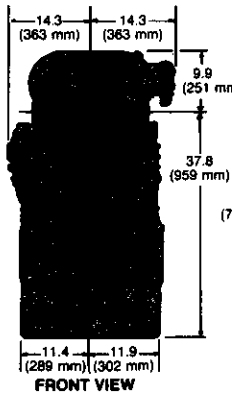


SIDE VIEW

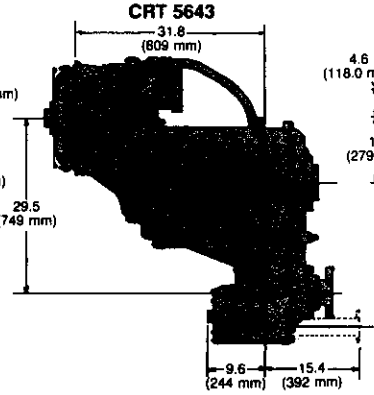


REAR VIEW

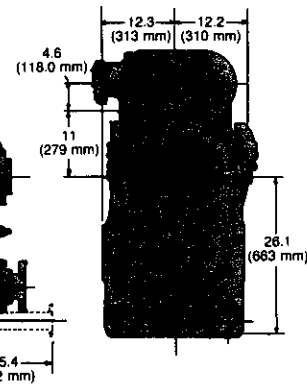
CRT 5643



FRONT VIEW

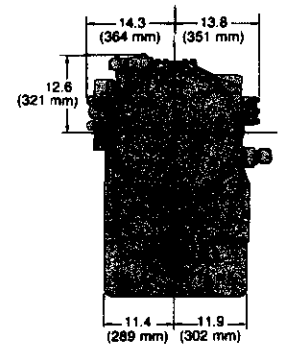


SIDE VIEW

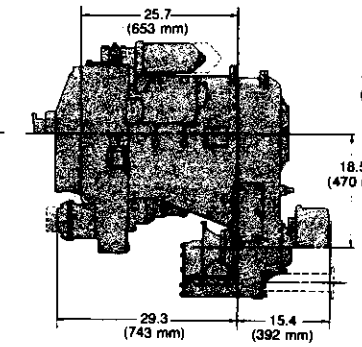


REAR VIEW

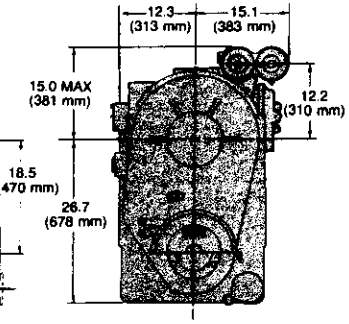
CRT 7033 LOADER VERSION



FRONT VIEW



SIDE VIEW



REAR VIEW

Note: Dimensions are given in inches with metric values in parentheses

design features and options

CRT 5633

- Transmission direct or remote mounted
- Choice of input and output flanges
- Wet direct engine mounting adaptations
- Parking brake
- Forward and reverse pressure taps
- Loader version with dropbox, dual outputs, auxiliary lubrication pump
- Nonloader version with dropbox, dual outputs
- Straight through version with stub shaft output
- Neutral start provision

CRT 5643

- Direct mounted only
- Wet type converter housing
- Choice of output flanges
- Neutral start provision
- Forward and reverse pressure taps
- Loader version with dropbox, dual outputs and auxiliary lubrication pump
- Ground drive PTO provision
- PTO pads top mounted

CRT 7033

- Transmission direct or remote mounted
- Choice of input and output flanges
- Wet direct engine mounting adaptations
- Parking brake
- Forward and reverse pressure taps
- Loader version with dropbox, dual outputs, auxiliary lubrication pump
- Nonloader version with dropbox, dual outputs
- Straight through version with stub shaft output
- Neutral start provision

'soft shift' system

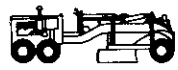
Smooth shifting at full power while changing direction of travel is the direct benefit of the Soft Shift system—a standard feature of all cycling series transmissions.

Soft shift is a system of orifices and a trimmer in the main control valve body which modulates pressure to a dual-area piston providing a progressive application of force on the clutch. The metered flow of oil controls the torque peak automatically during clutch engagement. With soft shift, there is no more slowing down to shift, no more dangerous stalls. Shift shock is reduced because soft shift controls the power.

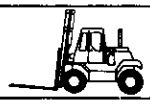
applications

CRT 5000/7000

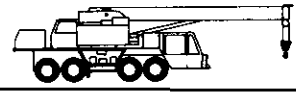
■ WHEEL LOADER



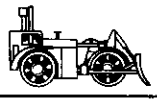
■ MOTOR GRADER



■ FORKLIFT TRUCK



■ HYDRAULIC CRANE



■ COMPACTOR

■ RUBBER TIRE TRACTOR

■ LOG LOADER

Applications using the CRT 5000/7000 Series transmissions have been precisely matched to assure the most efficient engine/transmission package for your operation. A unique, computer-assisted feature, called SCAAN, is provided by Original Equipment Manufacturers (OEM) and Detroit Diesel Allison distributors.

*SCAAN stands for System for Computerized Application Analysis and helps take the guesswork out of spec'ing equipment. What's more, it does it almost instantaneously through the use of a computer connected to OEM's and distributors.

SCAAN is fast and accurate. It can compute the necessary demand wheel horsepower vs. road speed relationships considering grades, vehicle GCW, frontal area and road surface. It can also provide an immediate analysis of available wheel horsepower resulting from a specified engine/transmission/axle combination.

WORLDWIDE REGIONAL OFFICES

Atlanta, Georgia (404/257-3630)
Naperville, Illinois (312/961-6750)
Dallas, Texas (214/659-5050)
Detroit, Michigan (313/556-5800)
Parsippany, New Jersey (201/993-4040)
Fremont, California (415/498-5200)
London, Ontario, Canada (519/452-5000)
Rotterdam, The Netherlands (31) 10-29-0000
Dandenong, Victoria, Australia (61) 3-797-7911
Athens, Greece (30) 1-770-6669
Coral Gables, Florida (305/446-4900)
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Mexico City, Mexico (905) 250-4354

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Northampton, England
Johannesburg, South Africa
Nairobi, Kenya
Adelaide, Australia
Brisbane, Australia
Sydney, Australia
West Perth, Australia
Jakarta, Indonesia
Taipei, Taiwan
Tokyo, Japan
Bogota, Colombia
Buenos Aires, Argentina
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Santiago, Chile
Sao Paulo, Brasil

Detroit Diesel Allison
Division of General Motors
P.O. Box 894, Indianapolis, Indiana 46206-0894
(317/242-2324)

SA1573 5-84 5M

Litho in U.S.A.

Allison Transmissions

SALES BRIEF

CODE
A – ADDITIONS
R – REVISIONS

Revised
Date 1/83 No. 82

TC 300, 400, 500, 800 & 900
INDUSTRIAL TORQUE CONVERTERS

I. TC 300 PRODUCT DESCRIPTION

GENERAL APPLICATIONS

The TC 300 series industrial torque converter is used in a variety of applications including backhoes, cranes, ditchers and trenchers, draglines, earth augers, material handling equipment, motor graders, rail switchers, shovels, log skidders, tow tractors, utility trucks, winches and hoists. This series incorporates many features and options in a compact, efficient and durable package to satisfy the requirements of the numerous types of industrial equipment.

RATINGS

General Ratings:	TC 350	TC 370
Max. input speed, rpm:	3000	3000
Max. net input power:	119 kW 160 hp	154 kW 206 hp
Max. net input torque:	380 N·m 280 lb ft	488 N·m 360 lb ft
Rating Chart Reference:	TC-7531	

PRODUCT COMPONENTS

Converter Models

The TC 300 series converters are three-element, two-phase, single-stage converter with self-contained oil system and integral charging pump. A direct-mounted cooler is also available as optional equipment.

Model	Stall Torque Ratio	Absorption Chart Number
TC 350	3.09:1	TC-13175
TC 370	2.47:1	TC-13177

Model Option Designation

TC = TORQMATIC ® CONVERTER

TCA = **TC with ACCESSORY drive.** This option used only with the industrial shaft output configuration provides for either a tailshaft governor or speedometer assembly.

TCO = **TC with OVERRUNNING clutch.** The optional TC 0300, used only on greased gear-drive models, is desirable for cranes, draglines, and shovels. The overrunning clutch makes it possible to safely lower light loads while utilizing full engine braking. This clutch prevents the turbine or output shaft speed from exceeding the speed of the engine. The clutch is a heavy-duty sprag assembly located between the converter-drive cover assembly and the turbine hub.

TCRD = **TC with REAR-DISCONNECT housing.** Certain standard flywheels and clutches will mate directly to the stub shaft in the rear disconnect housing without modifications. These clutches are the standard spring-loaded, automotive-type. The following list includes the manufacturer, adapter or flywheel part number, the clutch to which they adapt, and the rear disconnect housing minimum size number.

Part Number	RD Housing Adapter Clutch	Min. Size #
CONTINENTAL FLYWHEELS:		
M600C-405	Rockford 12TT	
MC00C-337	Rockford 11TT	3
MC00C-403	Rockford 14TT	3
F600C-305	Borg & Beck 10A-7	3
F600C-320	Borg & Beck 10A-6, 11A-6	3
K600C-401	Borg & Beck 12E, 13E	3
M600C-413	Borg & Beck 13E	3
M271C-303	Twin Disc 5738 C-10	3
M600C-400	Twin Disc B-11-1/2 G.T.	3
M330C-200	Twin Disc C-10 G.T.H.D.	3
M330C-400	Twin Disc C-10 G.T. Std.	3

B427C-410	Lipe-Rollway 14" (355mm) 140-1-509	3
R600C-455	Lipe-Rollway 15" (381mm) W.C.	2
X749C-400	Lipe-Rollway 15" (381mm) 2-plate clutches 2-38-S & Z15-6 O.D. must be machined	2
CONTINENTAL ADAPTERS:		
TC-20C-300	Borg & Beck 11A6	3
TC-20C-301	Borg & Beck 12E & 13E	3
TC-20C-302	Lipe-Rollway 13ML	
TC-20C-400	Lipe-Rollway 12ML	3
TC-20C-401	Twin Disc CLD G.T. or Rockford	3
HERCULES FLYWHEEL		
Z4986-C	Lipe-Rollway 13ML	

These components must be ordered directly from the manufacturer since DDA does not stock them. The above flywheels and adapters are not recommendations, but are for information only. Additional manufacturers and models will be added to the list as we hear of them.

Certain 355 mm (14 in) clutches can be installed in an SAE #3 housing, however, there may be a clearance problem. The clutch manufacturer and DDA should be contacted before the installation design is finalized.

Converter Designation. The first two numerical digits define the basic converter model. Example: TC 35x configuration uses the TC 350 torque converter.

Converter Output Variations. The third digit identifies the output configuration:

xx4 = Automotive flange
xx5 = Industrial shaft, standard bearing
xx6 = SAE 3 rear-disconnect housing
xx7 = Industrial shaft, extra-duty bearings
xx9 = SAE 2 rear-disconnect housing

Detail Variations. Example: TC 300-xxx - Dash Numbers

Dash No.	Oil Cooler	Paint Color	Manual Disconnect Housing SAE Size	Manual Disconnect Housing Engine-pilot Diameter	Manual Disconnect Clutch*	Gov. Drive Cable Adapt	Name Plate Option
-102	yes	yellow					
-116		yellow	#2	1.1803			
-117		yellow	#2	1.1803	yes		
-118	yes	yellow	#2	1.1803			
-119	yes	yellow	#2	1.1803	yes		
-120		yellow	#3	1.1803			
-121		yellow	#3	1.1803	yes		
-122	yes	yellow	#3	1.1803			
-123	yes	yellow	#3	1.1803	yes		
-127		yellow			yes		
-128		green					yes
-132		yellow	#3	1.1803	yes	yes	
-136		green	#2	0.9835			yes
-137		green	#3	0.9835			yes
-141		green	#2	0.9835		yes	yes
-143		yellow	#2	0.9835	yes	yes	
-144		yellow	#3	0.9835	yes	yes	
-146		yellow	#3	0.9835	yes		
-147		yellow					
-148		green					

***Manual Input Disconnect Clutch.** The disconnect clutch is available when the application requires a positive disconnect of engine power from the converter. This manual input clutch for TC 300 greased-gear drive units only is the standard overcenter dry-type.

Input Configuration

The TC 300 industrial converter series mates with an SAE #3 flywheel housing. An SAE #2 to SAE #3 housing adapter, Part No. 5174287 is available from Detroit Diesel Allison Service Parts. A greased-gear drive is standard on TC 300 converters. The optional flexdrive for TC 300 models depends on the specific engine model used.

Output Configuration

Both industrial and automotive output shafts are available with or without an optional rear output disconnect clutch. The optional output shafts makes these models adaptable to a variety of applications. The industrial shaft is available with standard-duty roller bearings or with extra-duty tapered bearings.

SPECIFICATIONS

Weight, dry approximate	kg	(lb)
Automotive:	87	(192)
Industrial:	96	(212)
Front disconnect, add:	53	(116)
Rear disconnect housing, add:	34	(76)
Accessory drive, add:	9.5	(21)

Oil System (Ref. AS 31-006)

Oil type:	C-3 hydraulic transmission fluid
Converter-out pressure,	kPa (psi)
full-throttle stall:	276 (40)
full-throttle no load:	621 (90)
Oil temperature,	
maximum converter-out:	135°C (275°F)
Converter oil capacity:	9.46 liters (2.5 U.S. gallons)

II. TC 400 and TC 500 PRODUCT DESCRIPTION

GENERAL APPLICATIONS

The TC 400 and TC 500 industrial torque converters are used in a variety of applications including shovels, cranes, draglines, backhoes, motor graders, winches and hoists, drilling rigs, snowplows, oil field equipment, rock crushers, ski tows, and rail switchers.

RATINGS

General Rating	**TC 400**		**TC 500**	
Max. input speed, rpm:	3000		2500	
Max. net input power:	246 kW	330 hp	307 kW	412 hp
Max. net input torque	834 N·m	615 lb ft	1173 N·m	865 lb ft
Rating Chart Reference	TC-7532		TC-7533	

CONVERTER MODELS

All Allison TC 400 and TC 500 series TORQMATIC® converters are three-element, two-phase, single-stage converters. The following converters are available.

Model	Stall Torque Ratio	Absorption Chart Number
TC 430	3.55:1	TC-6738
TC 450	3.20:1	TC-6739
TC 470	3.04:1	TC-6740
TC 530	3.48:1	TC-9745
TC 540	2.64:1	TC-9746
TC 550	3.23:1	TC-9747
TC 560	2.58:1	TC-9748
TC 570	3.04:1	TC-9749
TC 580	2.81:1	TC-9750

Model Option Designation

TC = TORQMATIC® CONVERTER

TCA = **TC with ACCESSORY drive.** This option used with the industrial shaft output configuration provides a drive for either a tailshaft governor assembly or speedometer.

TCD = **TC with manual input DISCONNECT clutch.** This is a spring-loaded automotive-type clutch. This dry-type overcenter option provides positive disconnect between the engine and the torque converter.

TCL = **TC with hydraulic LOCKUP clutch.** This option provides direct drive across the converter in lockup. When lockup is selected, the lockup selector valve hydraulically actuates the lockup clutch on the converter oil charging pump to create direct drive through the converter.

TCO = **TC with OVERRUNNING clutch.** This clutch is desirable for cranes, draglines, and shovels. The overrunning clutch makes it possible to safely lower light loads while utilizing full engine braking, as it prevents the turbine or output shaft speed from exceeding the speed of the engine. The clutch is a heavy-duty sprag assembly located between the converter drive cover assembly and the turbine hub.

Converter Designation. The first two numerical digits define the basic converter model. Example: TC 43x configuration uses the TC 430 torque converter.

Converter Output Variations. The third digit identifies the output configuration: xx4 = automotive flange; xx5 = industrial shaft.

Input Configuration

The TC 400 and TC 500 series converters are engine mounted with a flexdrive. The type of flexdrive depends on the specific engine model. The SAE #1 flywheel housing is standard in this series.

Output Configuration

Both TC 400 and TC 500 converter series offer either an industrial shaft or automotive-type output flange.

SPECIFICATIONS

	kg	(lb)
Weight, dry approximate:		
Automotive:	191	(420)
Industrial:	200	(442)
Front disconnect, add:	61	(134)
Accessory drive, add:	12	(27)

Oil System (Ref. AS 51-004)

	kPa	(psi)
Oil type:	C-3 hydraulic transmission fluid	
Converter-in pressure,		
full-throttle stall:	345-552	(50-80)
full-throttle no load:	827	(120)
Oil temperature,		
maximum converter-out:	135°C	(275°F)
Converter oil capacity:	Reference above AS drawing	

III. TC 800 and TC 900 PRODUCT DESCRIPTION GENERAL APPLICATIONS

The TC 800 and TC 900 industrial torque converters are used in a variety of applications including backhoes, winches and hoists, drilling rigs, oil field equipment, pump drives, rail equipment and rock crushers.

RATINGS

General Rating	TC 800 and TC 900 with Standard Oil Pump		TC 900 with Large Oil Pump	
Max. input speed, rpm:	2100		2100	
R Max. net input power:	318 kW	426 hp	438 kW	588 hp
R Max. net input torque:	1444 N·m	1065 lb ft	1993 N·m	1470 lb ft
Rating Chart Reference	TC-7534		TC-7535	

PRODUCT COMPONENTS

Converter Models

All Allison TC 800 and TC 900 series TORQMATIC ® converters are four-element, single-stage, three-phase with stator freewheel. Other features standard in this series are cast aluminum components, integral charging pump, disc flexdrive, and a choice of either an automotive or industrial output. The following converters are available.

Model	Stall Torque Ratio	Absorption Chart Number
TC 840	2.92:1	TC-2139
TC 850	3.98:1	TC-1664
TC 940	2.71:1	TC-2006
TC 950	3.67:1	TC-1271

Model Option Designation

TC = TORQMATIC® CONVERTER

TCA = **TC with ACCESSORY drive.** This option used with the industrial shaft output configuration provides a drive for either a tailshaft governor assembly or speedometer.

TCD = **TC with manual input DISCONNECT.** This optional dry-type overcenter clutch provides positive disconnect between the engine and the torque converter. This option is not available on TC 950 converter with the large pump.

Converter Designation. The first two numerical digits define the basic converter model. Example: TC 84x configuration uses a TC 840 torque converter.

Converter Output Variations. The third digit identifies the output configuration: xx4 = automotive flange; xx5 = industrial shaft. Either configuration is available on the TC 800 and TC 900 series.

Input Configuration

The TC 800 and TC 900 series converters are engine mounted with a flexdrive. The type of flexdrive, adapter models, and ring gears depend on the specific engine model. The SAE #1/2 flywheel housing with an SAE #0 to 1/2 adapter available is standard in this series.

Output Configuration

Both TC 800 and TC 900 converter series offer either industrial shaft or automotive-type output flange.

SPECIFICATIONS

	kg	(lb)
Weight, dry approximate:		
Automotive:	298	(658)
Industrial:	317	(698)
Front disconnect, add:	102	(225)
Accessory drive, add:	12	(27)

Oil System (Ref. AS 81-009)

Oil type:	C-3 hydraulic transmission fluid	
Converter-in pressure,	kPa	(psi)
full-throttle stall:	414-621	(60-90)
full-throttle no load:	827	(120)
Oil temperature,		
maximum converter-out:	135°C	(275°F)
Converter oil capacity	Reference above AS drawing.	

IV. TRANSMISSION RATING CHARTS

Each transmission rating chart is expressed in metric power (kW) on the front and U.S. horsepower (HP) on the backside. The rating charts are compatible with net engine power corrected to an altitude of 152 metres and a temperature of 29.4°C, which is equivalent to the SAE standard of 500 ft. and 85°F.

The following information may be helpful for interpreting and adjusting engine data for use with the rating charts.

ENGINE ALTITUDE & TEMPERATURE BASELINE

RATING STANDARD	ALTITUDE METRE (FT.)	TEMPERATURE °C (°F)	POWER DERATE FOR NATURALLY ASPIRATED ENGINE ADJUSTMENT TO 152 m, 29.4°C (500 FT., 85°F.)
SAE J-245	152 (500)	29.4 (85)	NO ADJUSTMENT
SAE J-816b	152 (500)	29.4 (85)	NO ADJUSTMENT
DIN 6270	305 (1000)	20.0 (68)	NO ADJUSTMENT
DIN 70020	SEA LEVEL	20.0 (68)	3.2%
BS AU141	SEA LEVEL	20.0 (68)	3.2%
BS 649	152 (500)	29.4 (85)	NO ADJUSTMENT
SMMT	152 (500)	20.0 (68)	1.7%
JAPANESE IND.	SEA LEVEL	20.0 (68)	3.2%
GOST-RUSSIAN	SEA LEVEL	20.0 (68)	3.2%

ENGINE POWER & TORQUE CORRECTIONS

US --- United States Customary
SI --- International System of Units (New Metric)
NSI --- Centimetre, Gram, Second System (Old Metric)

	UNITS		
	US	SI	NSI
TORQUE	LB.FT.	N•m	TORQUE (m)
POWER	HP	kW	HP (m)

Metre-Kilogram Symbols

mk•p
kg•m
mkg
kgm

Metric Horsepower Symbols

PS (Pferde Stärke)
CV (Cheval - Vapeur)
hk (häst kraft)
pk (paarde kracht)

LB.FT. = Torque (m) X 7.233
HP = HP (m) X 0.9863

$$HP = \frac{\text{Torque (m) X r/min}}{726}$$

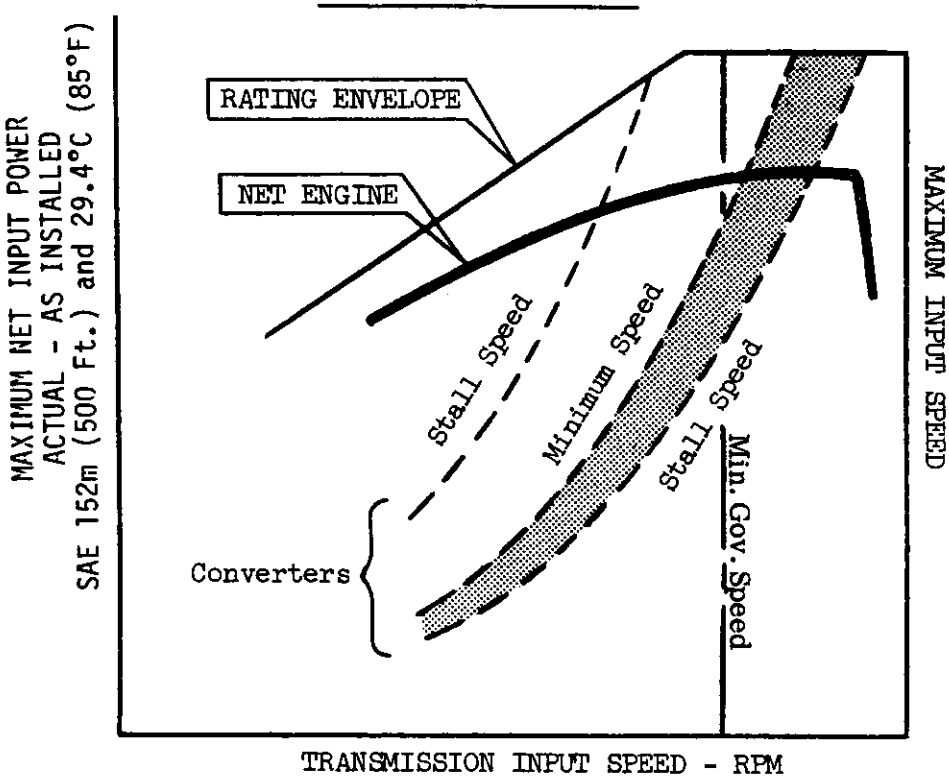
$$HP = \frac{\text{LB.FT. X r/min}}{5252}$$

N•m = Torque (m) X 9.807
kW = HP (m) X 0.7355

$$kW = \frac{\text{Torque (m) X r/min}}{974}$$

$$kW = \frac{\text{N•m X r/min}}{9549}$$

TYPICAL RATING CHART



A typical rating chart consists of a solid line envelope expressed in terms of power and speed, and a series of dotted lines each representing the capacity characteristics of the converters used in the transmission. In some instances, because of the converter's speed characteristics, the converter is defined by a band shown by dual dotted curves in which case the first line of the band represents the minimum speed characteristics and the second line the stall speed.

All rating charts carry a maximum input (governed) speed rating, whereas only a few have a minimum governed speed limit. In these cases, the full load governed speed of the engine must fall on or above the minimum governed speed line but cannot exceed the maximum input speed rating.

To determine whether a given engine is within the rating of a converter and transmission, the net engine curve must be plotted on the rating chart as follows:

- Correct gross engine for 152m (500 ft.) altitude and 29°C (85°F) temperature and deduct engine accessories.
- Plot this net engine power curve (corrected power less accessories) on converter or transmission rating chart.
- Investigate converter and lockup operation in the following manner after selecting proper converter.

  CONVERTER OPERATION (All Transmissions)

  The net engine power curve must intersect the converter stall line within the envelope as defined by the solid line envelope.

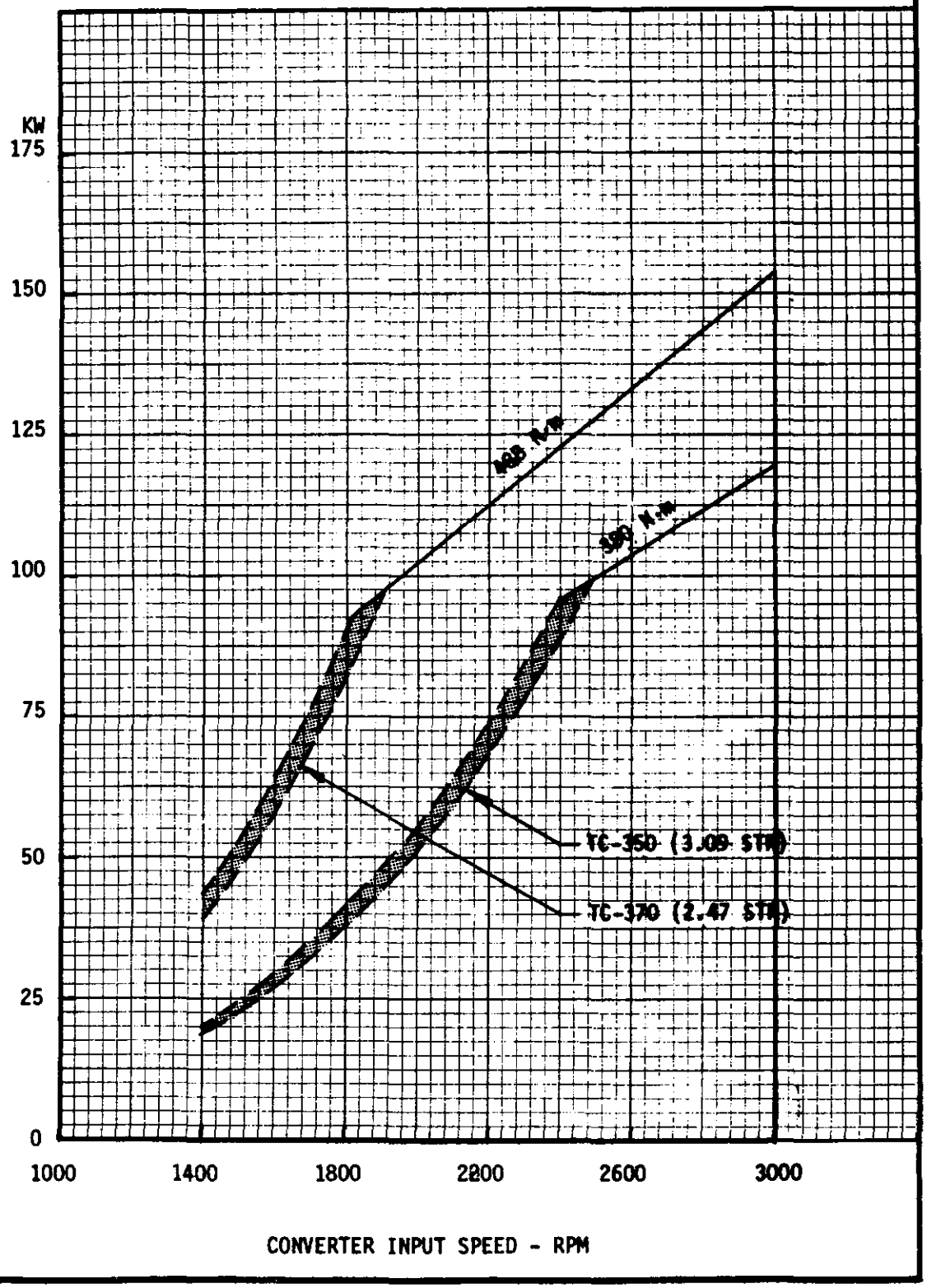
  If the converter speed characteristics are represented by a band (shaded area), the power curve of the engine must intersect both lines of the converter within the rating envelope.

  LOCKUP OPERATION (Transmissions with Lockup)

  The engine power curve must fall below the solid-line envelope for all speeds defined by the rating envelope.

Allison Transmissions	ENGINEER	PERF. APPR.	TC-7531
	ALBIN	BDR	
	3-11-78	3-30-78	

TC-300 CONVERTER RATING CHART



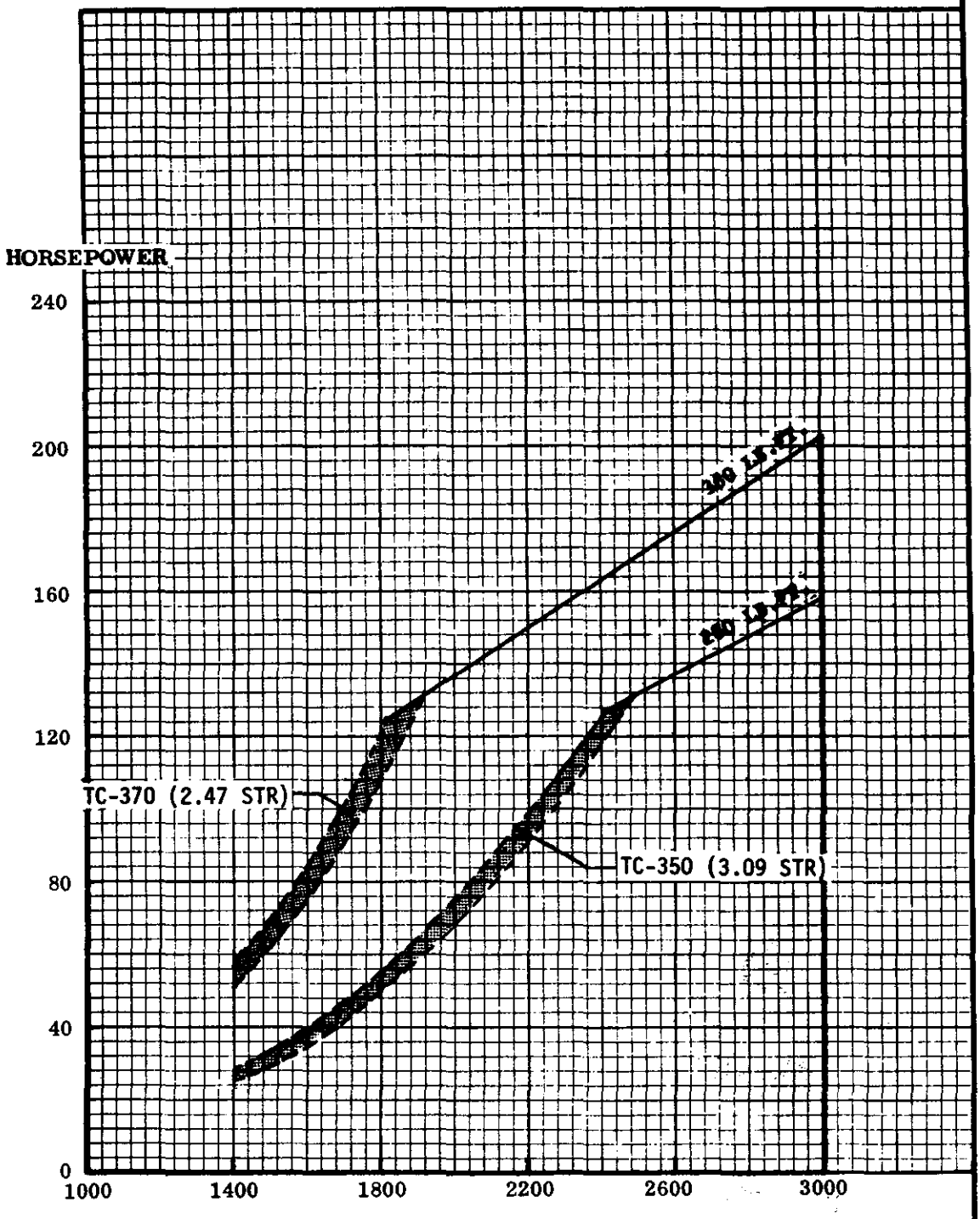
FORM 8179

REVISED & REDRAWN - ORDO, 3-29-73

Allison Transmissions

ENGINEER	PERF. APPR.	
Ramsey 11-19-62	[illegible] 4-2-73	TC-7531

TC-300 CONVERTER RATING CHART

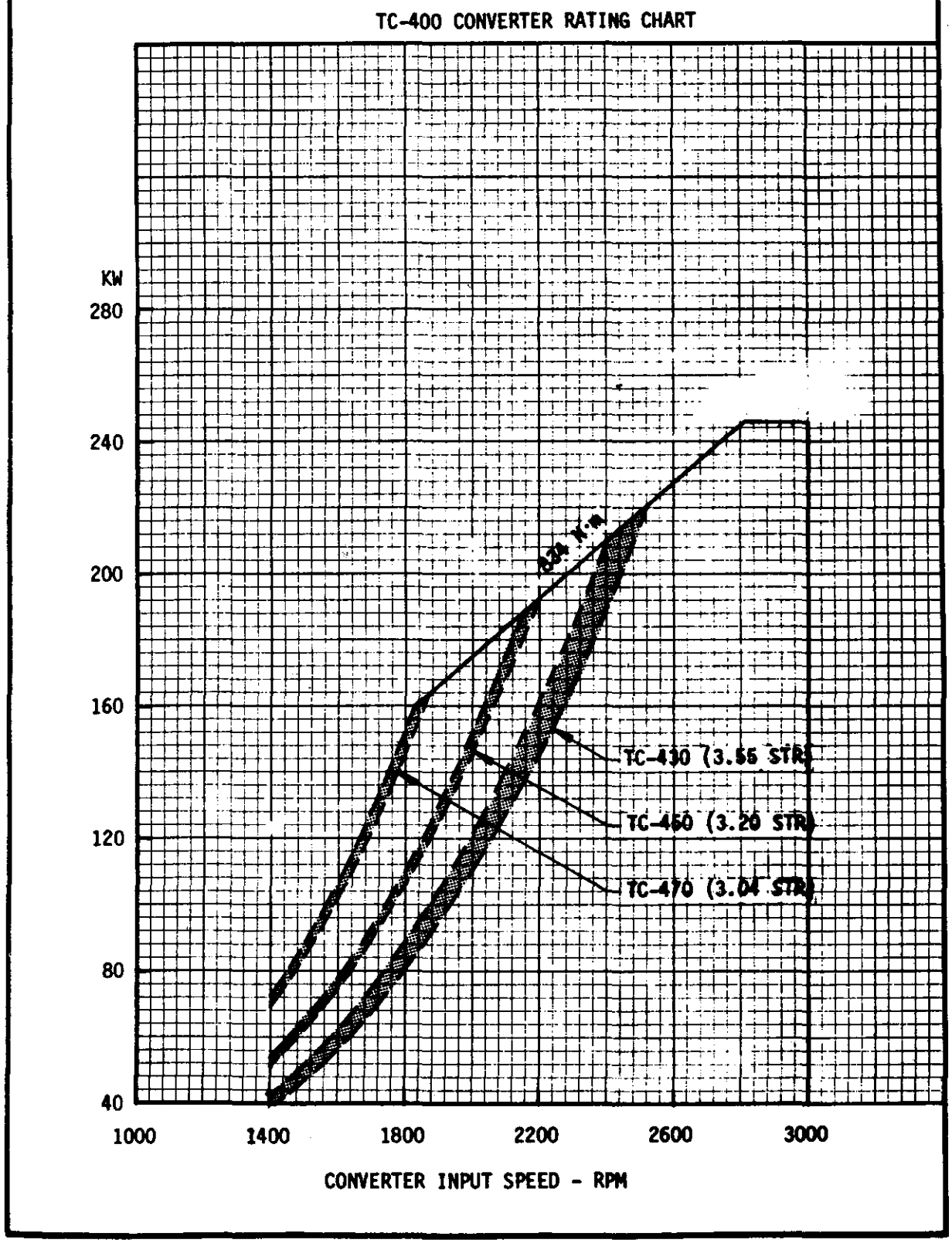


FORM 8179

REVISED - AULL 6/19/80

Allison Transmissions

ENGINEER	PERF APPR.	TC-7532
ALBIN 3-11-78	6-23-80	



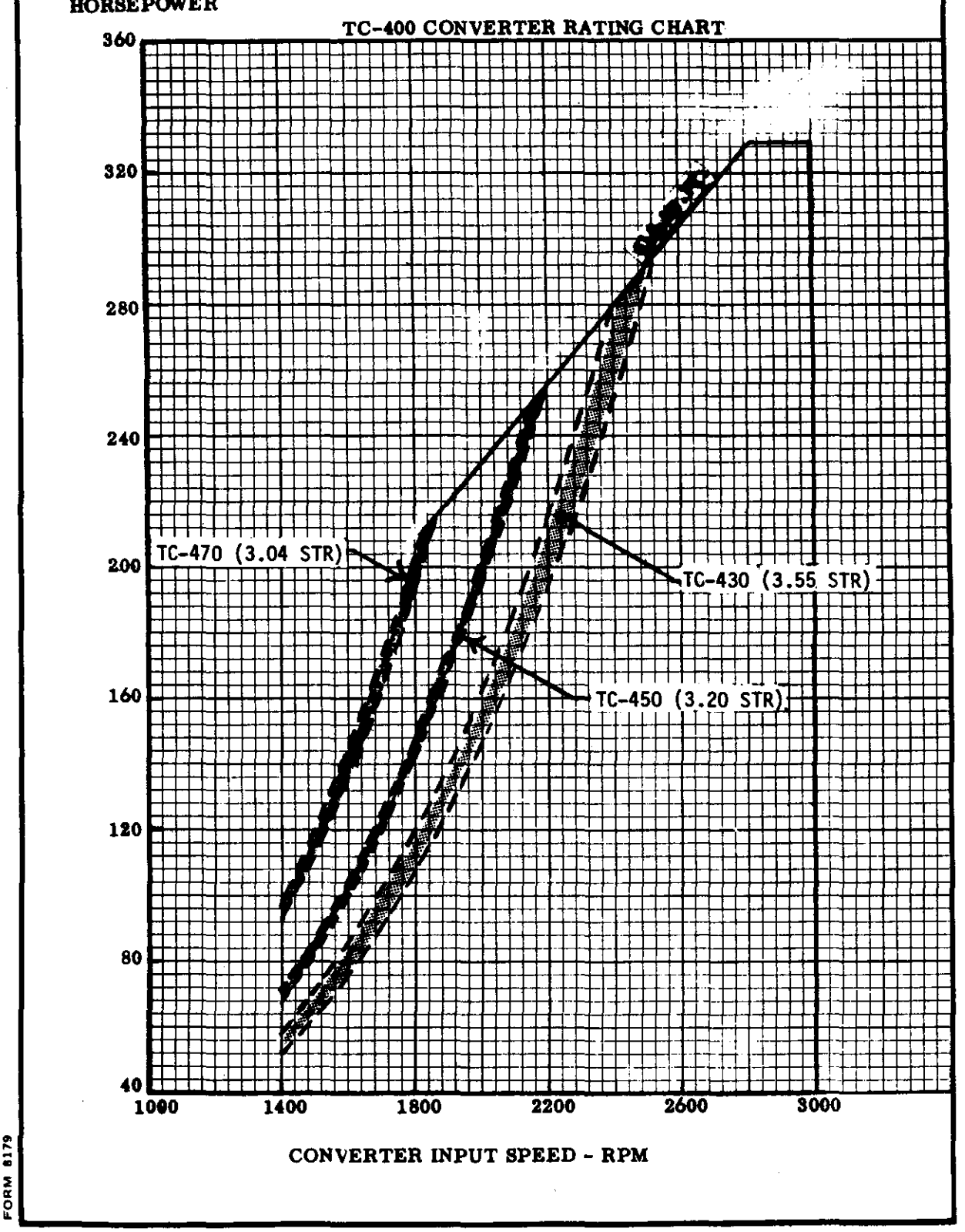
FORM 8179

REVISED - AULL 6/19/80

Allison Transmissions

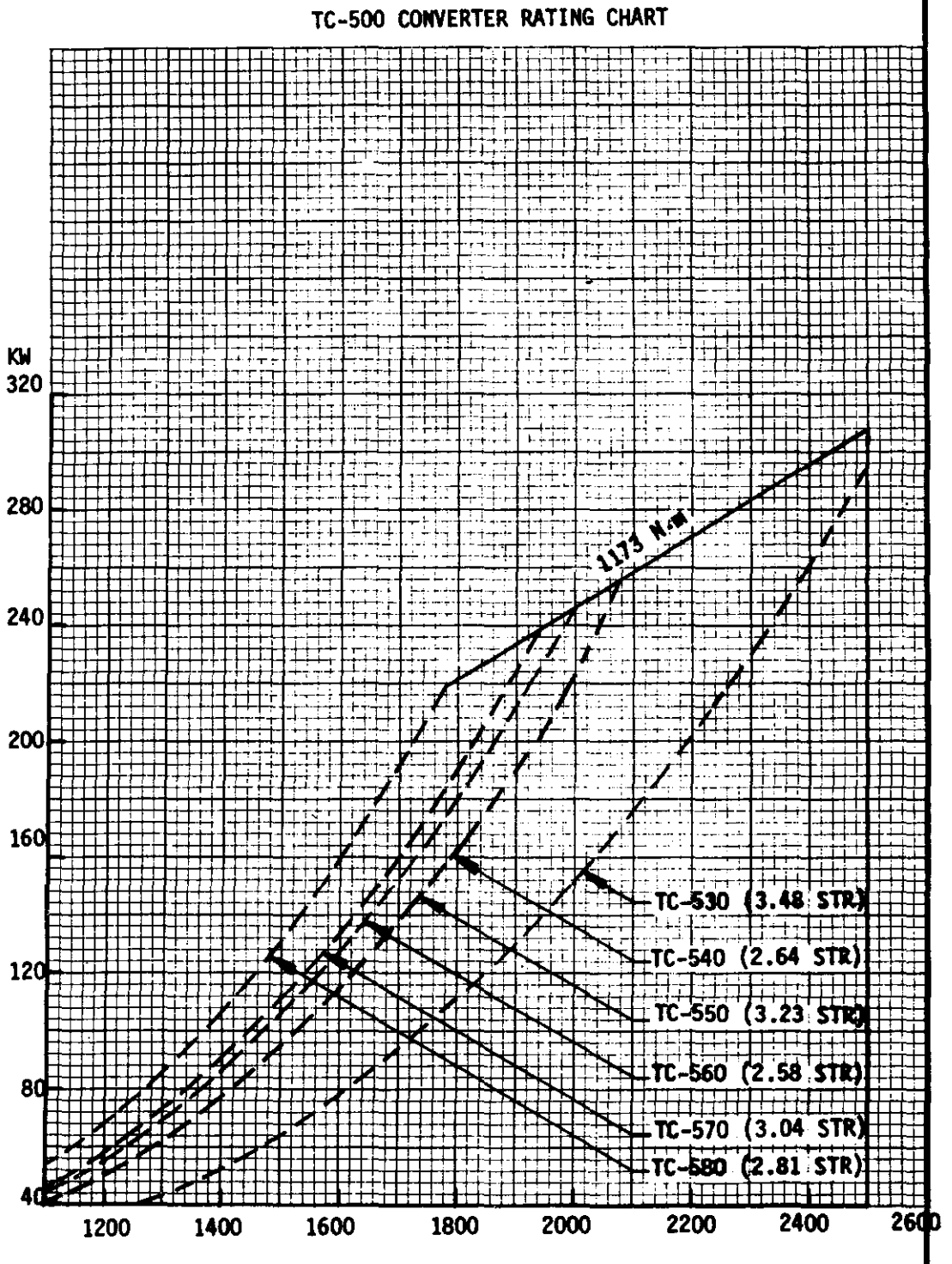
ENGINEER	PERF. APPR.
RAMSEY	
11-19-62	

TC-7532



FORM 8179

Allison Transmissions	ENGINEER	PERF. APPR.	TC-7533
	ALBIN 3-11-78	[illegible] 3-10-78	

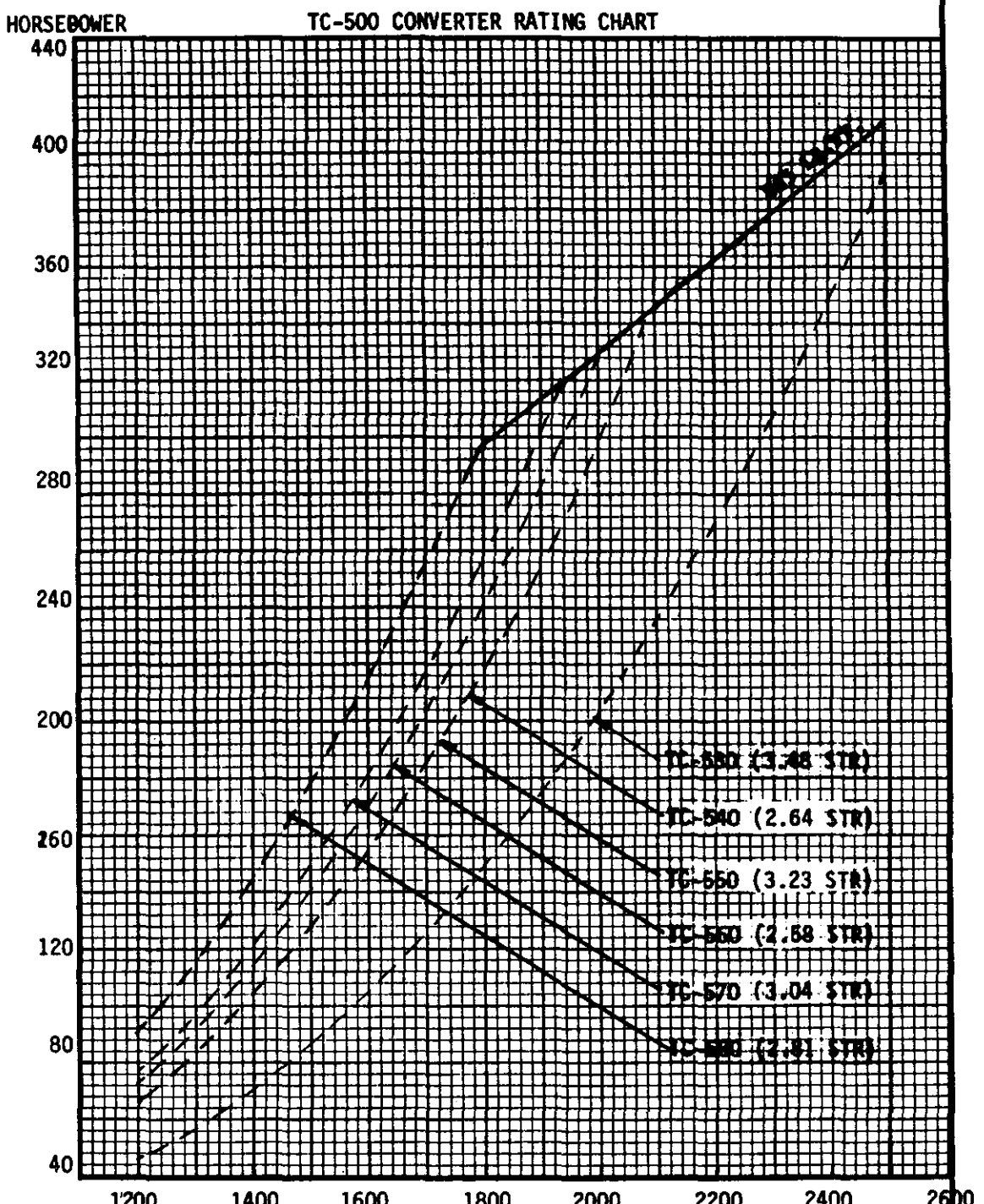


FORM 8178

REVISED AND REDRAWN - POCIASK, 9-6-77

Allison Transmissions

ENGINEER	PERF. APPR.	
RAMSEY	[illegible]	TC-7933
11-19-62	9-7-77	

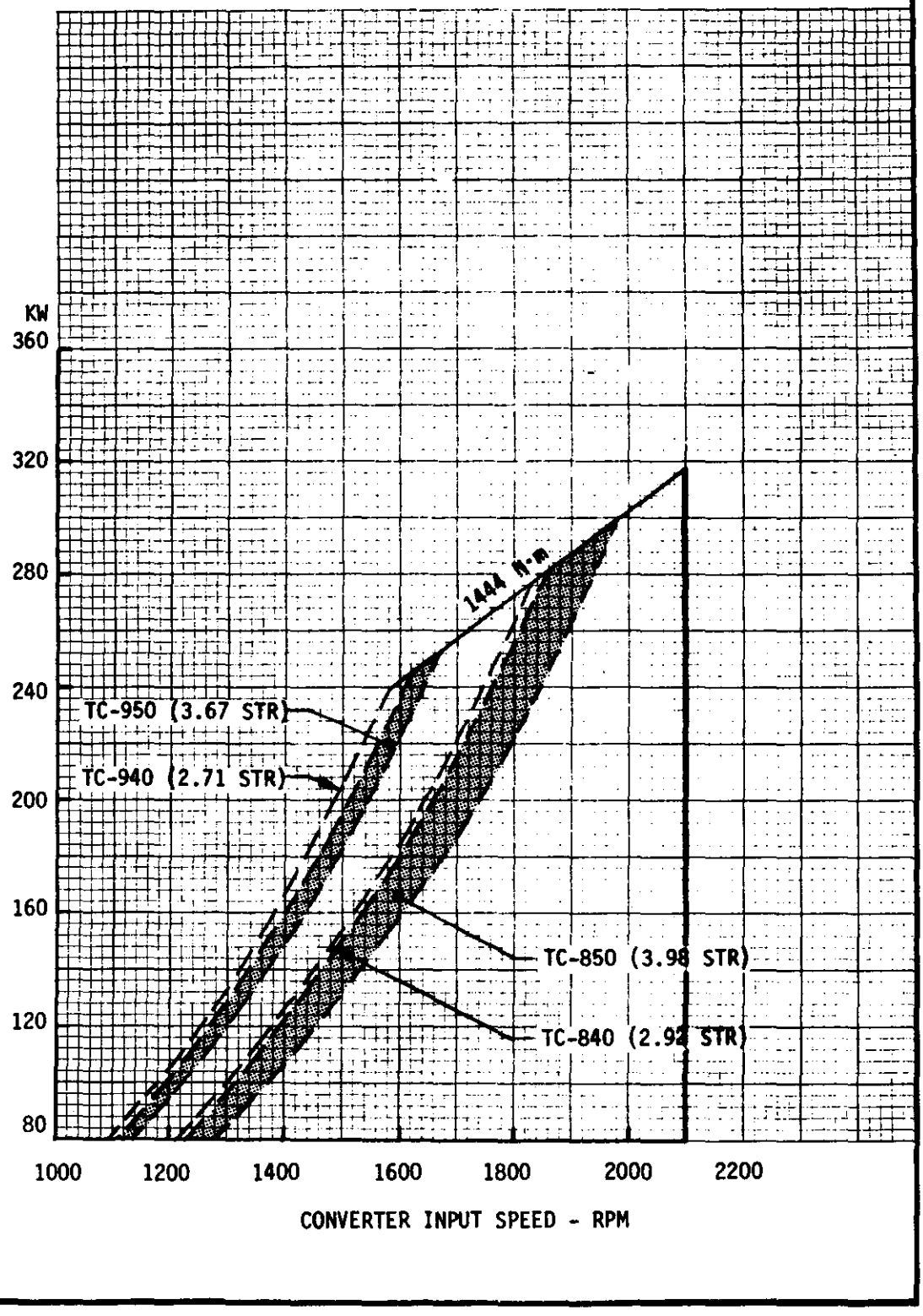


FORM 8178

Allison Transmissions

ENGINEER	PERF. APPR.	
ALBIN	RDR	TC-7534
3-11-78	3-30-78	

TC-800, 900 CONVERTER RATING CHART
(STANDARD OIL PUMP)



FORM 8178

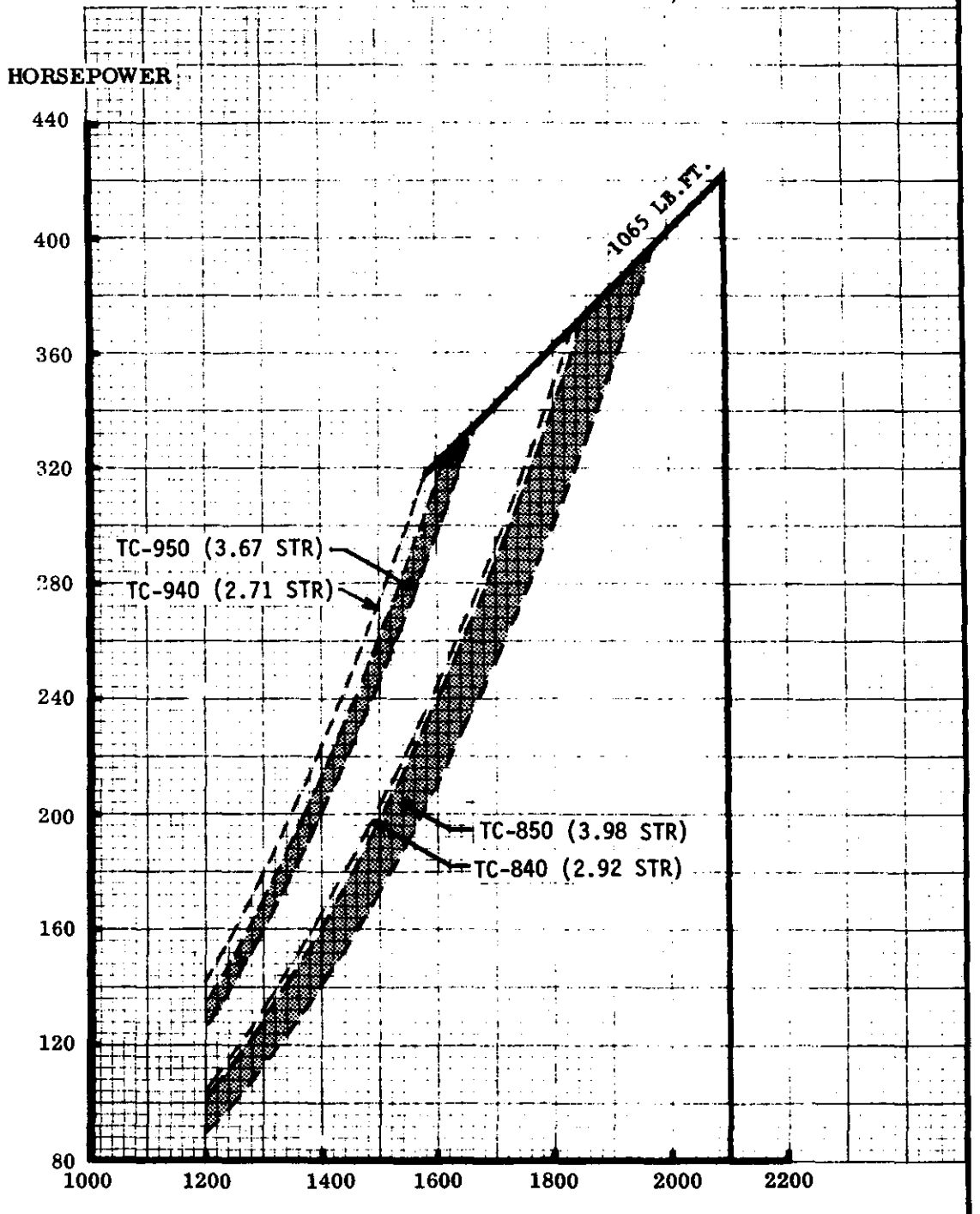
REVISED & REDRAWN - ORDO, 3-29-73

Allison Transmissions

ENGINEER	PERF. APPR.	
Ramsey 11-19-62	EDR 4-2-73	TC-7534

TC-800, 900 CONVERTER RATING CHART

(STANDARD OIL PUMP)

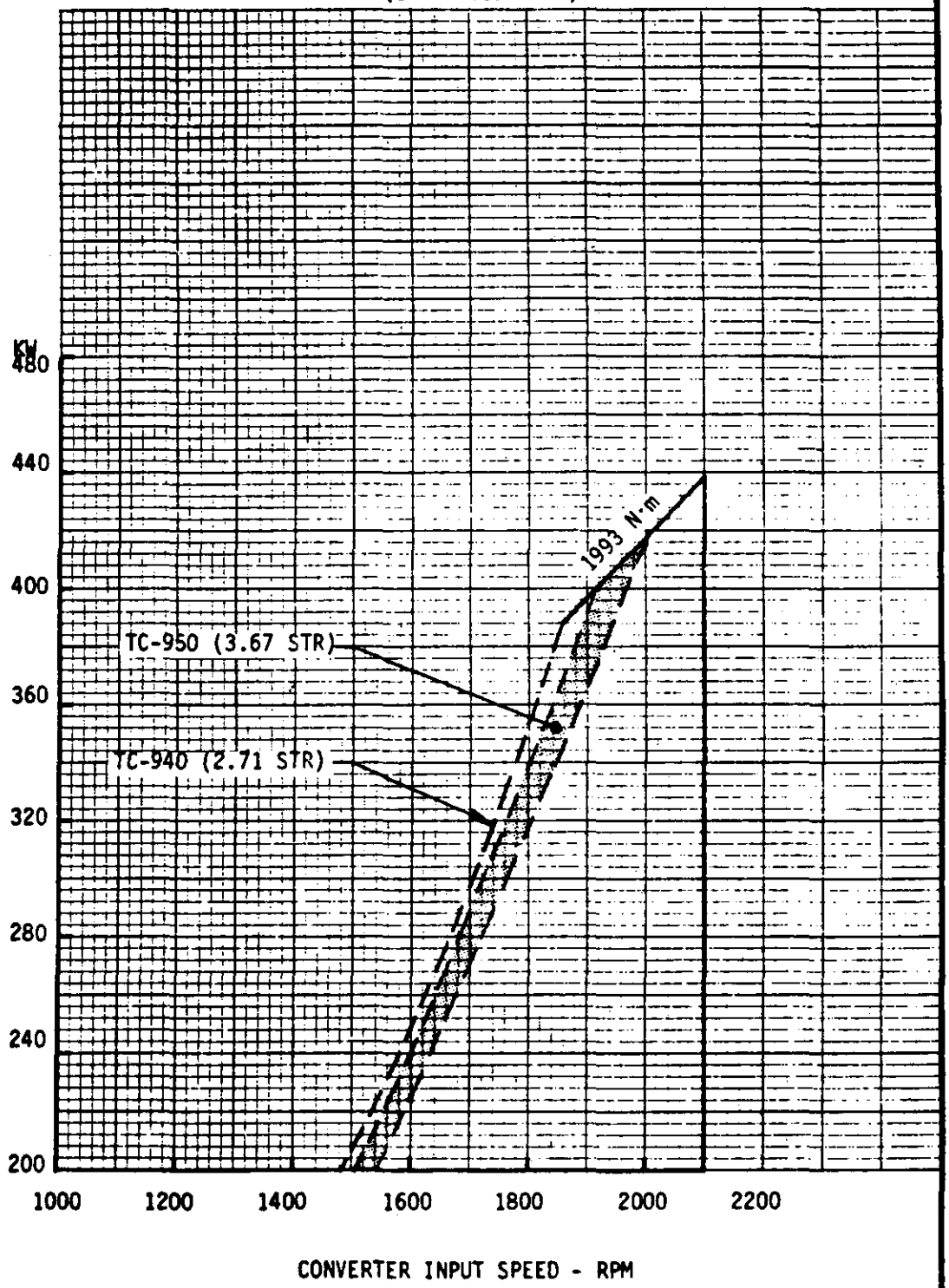


FORM 8178

Allison Transmissions

ENGINEER	PERF. APPR.	
ALBIN	[illegible]	TC-7535
3-10-78	3-10-78	

TC-900 CONVERTER RATING CHART
(LARGE OIL PUMP)



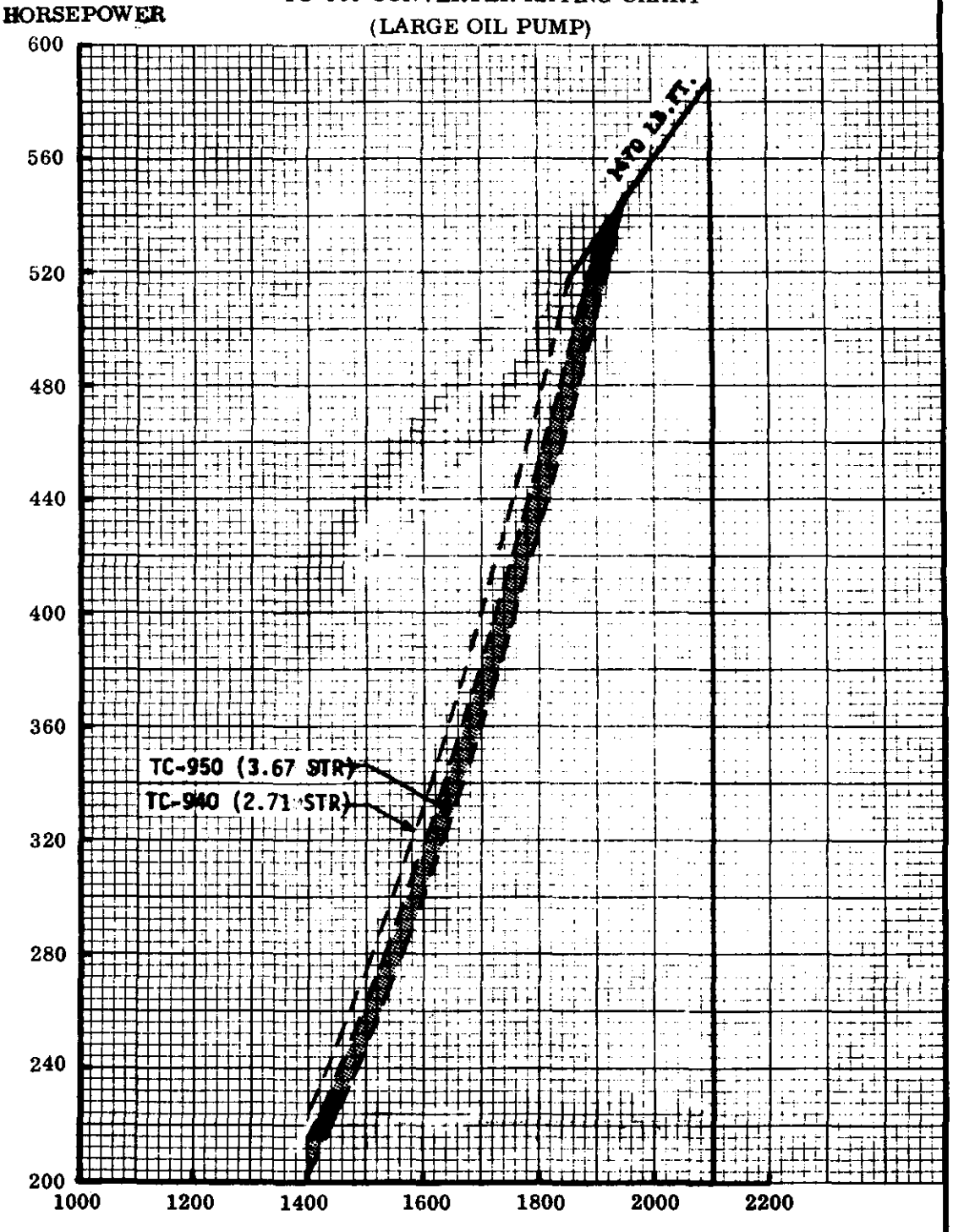
FORM 8178

REVISED & REDRAWN - ORDO, 3-29-73

Allison Transmissions

ENGINEER	PERF. APPR.	
Ramsey	[illegible]	TC -7535
11-19-62	4-2-73	

TC-900 CONVERTER RATING CHART
(LARGE OIL PUMP)



FORM 8178

V. SUPPORT EQUIPMENT

This section describes the required support equipment for the industrial torque converters and lists the suppliers of these items. When any changes or corrections to this information are noted, please advise Detroit Diesel Allison GM, Transmissions Application Engineering, K9, P. O. Box 894, Indianapolis, IN 46206. Revisions of this list will be published as additional information becomes available.

Engine Adaptation Pieces

DDA Adaptation Drawings describe the physical adaptations of our converters with the various engines manufactured.

Input and Output Yokes and Flanges

Yokes and flanges can be purchased with the converter as a specified option or directly from the flange manufacturer. Reference drawing AS 00-012 for installation details. Flange manufacturers are listed below:

Borg Warner
Mechanics Division
2020 Harrison Avenue
Rockford, IL 61101
Phone: (815) 398-3000

Dana Corporation
Heavy Duty Marketing Division
P. O. Box 321
Toledo, OH 43691
Phone: (419) 866-1841

Twin Disc, Inc.
1340 Racine Street
Racine, WI 53403
Phone: (414) 634-1981

Speedometer and Governor Drive Option

Reference DDA Installation Drawings:

TC 300	AS 31-011
TC 400 and TC 500	AS 51-012
TC 800 and TC 900	AS 81-008

Temperature and Pressure Gauges

Temperature and pressure gauge requirements are referenced as follows:

TC 300	AS 31-006
TC 400 and TC 500	AS 51-004
TC 800 and TC 900	AS 81-003 and AS 81-009

The temperature gauge is a capillary type with three different capillary lengths available. These gauges may be ordered from DDA Service Parts:

Temperature Gauge Part No.	Capillary Length
6838457	3.20-3.35 m (10.5-11.0 ft)
6838458	1.83-1.98 m (6.0- 6.5 ft)
6838459	1.22-1.37 m (4.0- 4.5 ft)

Sources for an appropriate pressure gauge are:

AMETEK, U.S. Gauge Division
900 Clymer Avenue
Sellersville, PA 18960
Phone: (215) 257-6531

VDO-ARGO Instruments, Inc.
980 Brooke Road
Winchester, VA 22601
Phone: (703) 622-1700

Heat Exchangers

Reference DDA Installation Drawings and heat exchanger manufacturers listed below:

TC 300	AS 31-003
TC 400 and TC 500	AS 51-001 without retarder AS 51-002 with retarder
TC 800 and TC 900	AS 81-002

Oil to Water

American Standard
Heat Transfer Division
P. O. Box 1102
Buffalo, NY 14240
Phone: (716) 897-2800

G & O Manufacturing Co.
138 Winchester Avenue
New Haven, CT 06508
Phone: (203) 562-5121

Modine Manufacturing Co.
1500 DeKoven Avenue
Racine, WI 53401
Phone: (414) 633-2411

Harrison Radiator Division, GM
200 Upper Mountain Road
Lockport, NY 14094
Phone: (716) 439-3096

Perfex Group
500 W. Oklahoma
Milwaukee, WI 53207
Phone: (414) 744-1000

Sen-Dure Products, Inc.
Bay Shore, NY 11707
Phone: (516) 665-0689

Heatex, Ltd.
2225 Lapierre St.
LaSalle 660, Quebec, Canada
Phone: (514) 365-6100

Stewart-Warner Corporation
Southwind Division
1514 Drover Street
Indianapolis, IN 46221
Phone: (317) 682-8411

Young Radiator Co.
2825 Four Mile Road
Racine, WI 53404
Phone: (414) 639-1010

Oil to Air

Dunham Bush, Inc.
Riverside Division
1850 Massachusetts Avenue
Riverside, CA 92507
Phone: (714) 684-0991

Hayden Inc.
1531 Pomona Road
Corona, CA 91720
Phone: (714) 735-4900

Karmazin
3776 Eleventh Street
Wyandotte, MI 48192
Phone: (313) 282-3776

External Main Circuit Oil Filters

Specifications for filters are shown on respective AS drawings and the filter manufacturer is listed below:

TC 300	AS 31-006
TC 400 and TC 500	AS 51-004
TC 800 and TC 900	AS 81-003 and 81-009

AC Spark Plug Division, GM
1300 N. Dart Highway
Flint, MI 48556
Phone: (313) 766-5000

Oil Level Recommendations

Reference DDA installation drawings listed below:

TC 300	AS 31-006
TC 400 and TC 500	AS 51-004
TC 800 and TC 900	AS 81-003 and 81-009

VI. INDUSTRIAL CONVERTER SERIES: TC 300 INSTALLATION DRAWINGS

The Application Specification (AS) drawing series for the TC 300 industrial converter has been updated to include the latest available information.

This series utilizes a Basic Installation Drawing, AS 31-001 which is used in combination with the individual drawings describing various TC 300 features. All drawings utilize U.S. units of measure unless otherwise specified.

TC 300 Installation Drawings

Drawing No.	Drawing Title
AS 00-002	Engine-Transmission/Converter Adaptation Requirements
AS 00-006	Grease Recommendations
AS 00-007	Physical Adaptation Chart TC 300
AS 00-009	Heat Exchanger Performance
AS 00-012	Output Flange Options
AS 00-016	Flexplate Input Drive Data
AS 00-036	Flexdrive Characteristics
AS 31-001	Basic Installation Drawing
AS 31-003	Cooler Oil Flow, TC 300
AS 31-004	Installation Diagram, TC 0300
AS 31-005	Power Take-off Sprocket Chart
AS 31-006	External Hydraulic Circuit
AS 31-007	Recommended Support Plate Construction
AS 31-008	Industrial Output with H.D. Bearings
AS 31-009	Rear Disconnect Output
AS 31-010	10" Overcenter Front Disconnect Clutch
AS 31-011	Governor Drive Option
AS 31-012	Special Industrial Output
AS 31-013	Chain Coupling Output
AS 31-015	Rear Disconnect Output

VII. INDUSTRIAL CONVERTER SERIES: TC 400 and TC 500 Installation and Physical Adaptation Drawings

The Application Specification (AS) Drawing series for the TC 400 and TC 500 transmission has been updated to include the latest available information. This series utilizes a Basic Installation Drawing, AS 51-003, in combination with the individual drawings describing various torque converter features in this series. All drawings utilize U.S. units of measure unless otherwise specified.

TC 400 and TC 500 Installation Drawings

Drawing No.	Drawing Title
AS 00-001	Converter Drive Adaptation
AS 00-002	Engine-converter Adaptation Requirements
AS 00-008	Recommended Support Construction
AS 00-012	Drive Flange Chart
AS 51-001	Cooler Oil Flow TC 500 Series
AS 51-002	Brake Absorption Curve
AS 51-003	Basic Installation Drawing
AS 51-004	External Hydraulic Circuit Requirements, Converter Only
AS 51-005	External Hydraulic Circuit Requirements with Transmission
AS 51-007	Lockup Clutch Option
AS 51-008	Clutch Drive Adaptation
AS 51-009	Sprocket Load Chart
AS 51-011	Special Output Shaft
AS 51-012	Governor Drive Options
AS 51-014	Converter Feedback Performance, TC 500 Series

TC 400 and TC 500 Physical Adaptation Drawings

Drawing No.	Converter	Engine	Model
AS 04-008	TC 400	Detroit Diesel	6V-53
AS 04-022	TC 500	Caterpillar	D-343
AS 04-028	TC 500	Caterpillar	D-333, 1673
AS 04-029	TC 500	Cummins	H&N, INLINE
AS 04-033	TC 400	Caterpillar	D-333, 1673
AS 04-042	TC 400	Cummins	V6-200, V8-265
AS 04-043	TC 400	Detroit Diesel	71 SERIES
AS 04-045	TC 400	Cummins	H&N INLINE
AS 04-048	TC 500	Rolls Royce	C6S
AS 04-049	TC 400	IHC	UV549
AS 04-064	TC 400	Deutz	F8L714
AS 04-065	TC 500	Deutz	F12L714
AS 04-074	TC 500	Waukesha	H-844
AS 04-076	TC 400	Eimco 115	ELECTRIC
AS 04-077	TC 500	Hercules	HS6182
AS 04-081	TC 500	Waukesha	145-GZ
AS 04-082	TCL 500	Waukesha	TH-844
AS 04-088	TC 500	Caterpillar	1674, D334
AS 04-098	TC 500	Continental	S6820
AS 04-114	TC 400	Caterpillar	C SERIES
AS 04-204	TC 400	Caterpillar	3306

VIII. INDUSTRIAL CONVERTER SERIES: TC 800 and TC 900 INSTALLATION DRAWINGS

The Application Specification (AS) Drawing series for the TC 800 and TC 900 transmission has been updated to include the latest available information.

This series utilizes a Basic Installation Drawing, AS 81-004, in combination with the individual drawings describing various torque converter features in this series. All drawings utilize U.S. units of measure unless otherwise specified.

TC 800 and TC 900 Installation Drawings

Drawing No.	Drawing Title
AS 00-002	Engine Transmission/Converter Adaptation Requirements
AS 00-008	Recommended Support Plates
AS 00-012	Output Flange Options
AS 00-015	Physical Adaptation Chart
AS 81-002	Cooler Oil Flow
AS 81-004	Basic Installation Drawing
AS 81-005	Front Disconnect Clutch Option
AS 81-007	Sprocket Load Chart
AS 81-008	Governor Drive Option
AS 81-009	External Hydraulic Circuit

TC 800 and TC 900 Physical Adaptation Drawings

Drawing No.	Converter	Engine	Model
AS 04-031	TC 800 & TC 900	Caterpillar	D343
AS 04-037	TC 800 & TC 900	Detroit Diesel	8V71, 12V71
R AS 04-046	TC 800 & TC 900	Detroit Diesel	16V71, 8V92T
AS 04-047	TC 800 & TC 900	Detroit Diesel	6-110
AS 04-072	TC 800 & TC 900	General Electric	350 HP MOTOR
AS 04-073	TC 800 & TC 900	Cummins	NVH
AS 04-125	TC 800 & TC 900	Caterpillar	D343C
AS 04-198	TC 800 & TC 900	Caterpillar	3408, 3412

REFERENCE

MANUALS

TC 300

- SA 1099 Service Manual
- SA 1039 Parts Catalog
- SA 1405 Operators Manual

TC 400

- SA 1136 Service Manual
- SA 1116 Parts Catalog
- SA 1405 Operators Manual

TC 500

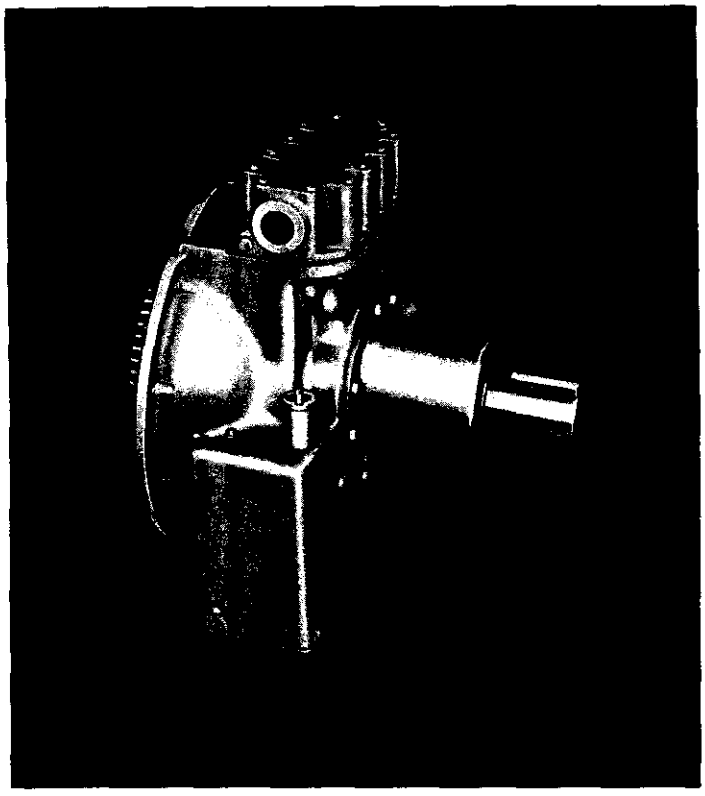
- SA 1058 Service Manual
- SA 1057 Parts Catalog
- SA 1405 Operators Manual

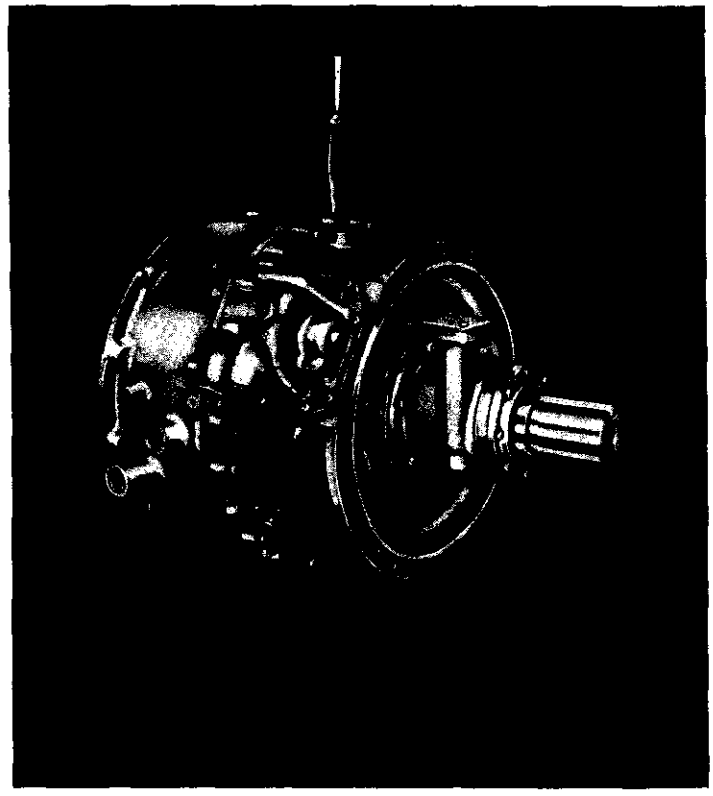
TC 800, TC 900

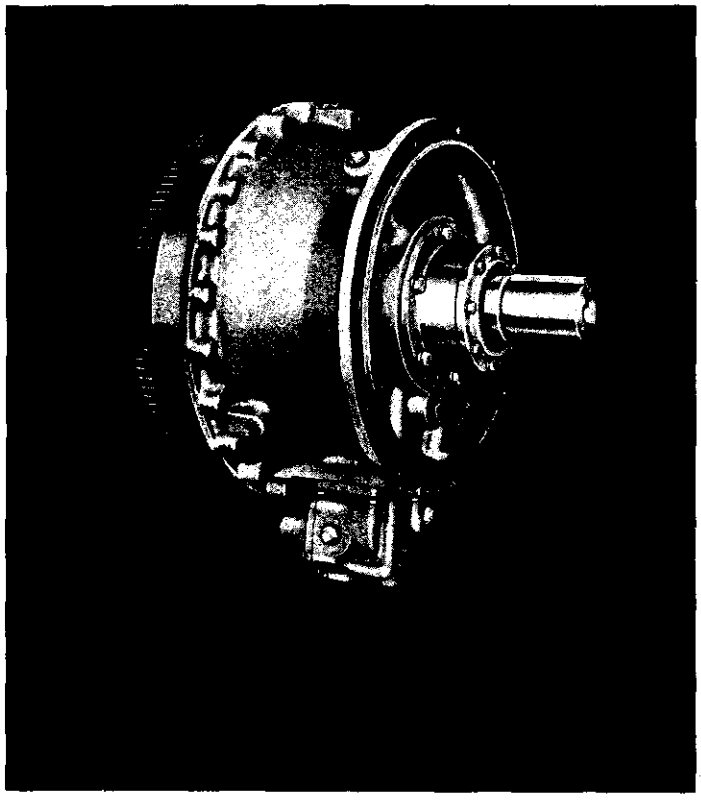
- SA 1054 Service Manual
- SA 1038 Parts Catalog
- SA 1405 Operators Manual

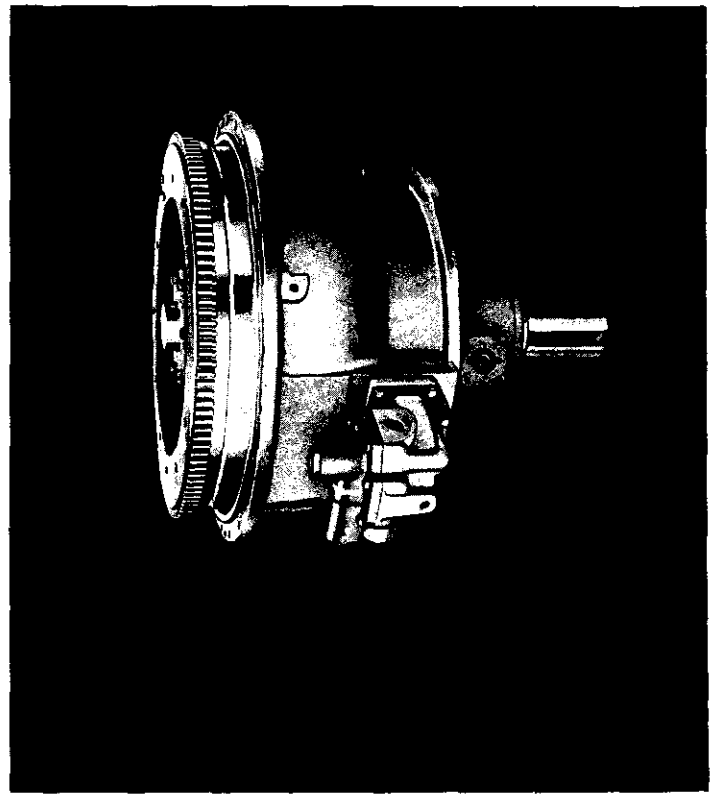
Prepared and distributed by Sales Development, J-5, Detroit Diesel Allison, P.O. Box 894, Indianapolis, Indiana 46206

Allison Industrial Torque Converters





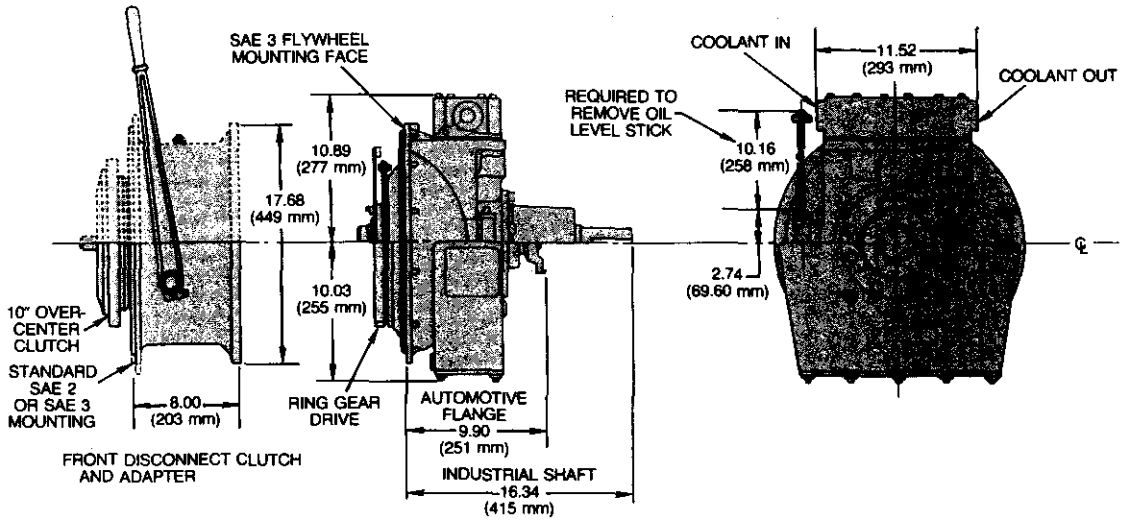




TC 300 SERIES

The TC 300 series industrial torque converter is used in a variety of applications including backhoes, cranes, ditchers and trenchers, draglines, earth augers, material handling equipment, motor graders, rail switchers, shovels, log skidders, tow tractors, utility trucks, winches and hoists.

MOUNTING DIMENSIONS



Note: Dimensions are given in inches with metric values in parentheses.

BUILT IN

- Oil system
- Charging pump
- Oil sump
- Standard greased gear drive

OPTIONS

- Over-running clutch
- Rear disconnect housing
- Oil cooler
- Industrial shaft output or automotive flanges
- Manual input disconnect clutch
- Accessory drive

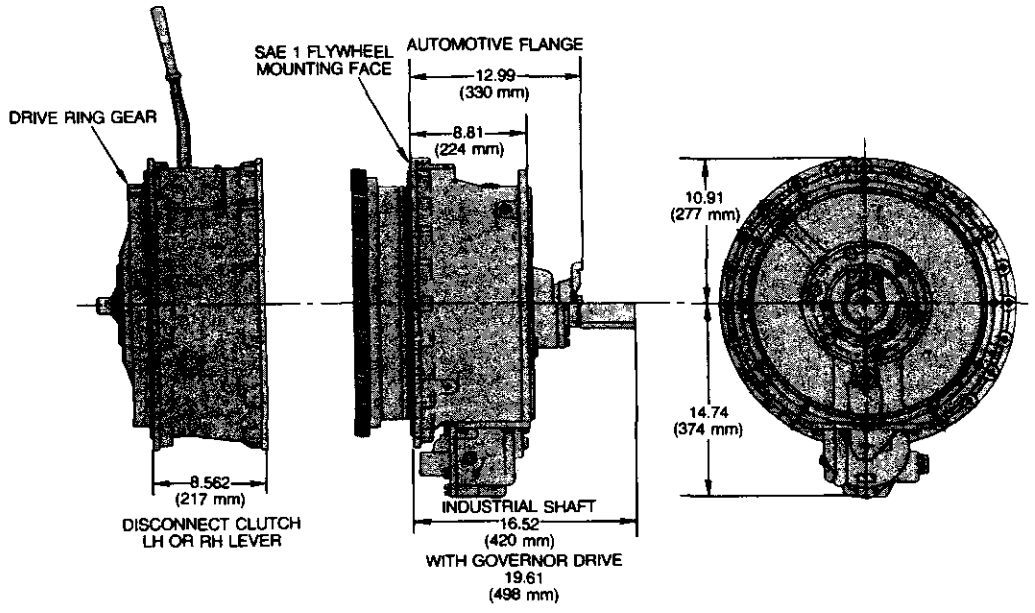
SPECIFICATIONS

Model	
Stall torque ratio	
Input power (max) net	
Input torque (max) net	
Input speed (max)	
Oil type	
Converter oil capacity	
Type	
Output shaft	
Flywheel housing	SAE 3
Weight	

TC 400 SERIES

The TC 400 series industrial torque converters are used in a variety of applications including shovels, cranes, draglines, backhoes, motor graders, winches and hoists, drilling rigs, snowplows, oil field equipment, rock crushers, ski tows and rail switchers.

MOUNTING DIMENSIONS



Note: Dimensions are given in inches with metric values in parentheses.

Meets today's needs . . .

Aimed at a specific field in wide range of drive requirements. Smooth, efficient transmission of engine power to the job means lower maintenance cost, faster job cycles, lower fuel costs and less downtime.

Matched to ECONOMY STANDARDS

and with all these options

- Manual overcenter input disconnect clutch
- Over-running clutch
- Choice of torque converter ratios
- Industrial shaft output or automotive flanges
- Accessory drive
- Hydraulic lockup clutch

SPECIFICATIONS

Model	TC 420	TC 430	TC 440
Stall torque ratio	2.58:1	3.29:1	3.91:1
Input power (max) net	330 HP (246 kW)		
Input torque (max) net	615 lb ft (834 N-m)		
Input speed (max)	3000 rpm		
Oil type	Hydraulic transmission fluid type C-3		
Converter oil capacity	Remote sump 10 US gal (37.9 Liters) min.		
Type	1-stage, 2-phase, 3-element		
Output shaft	Automotive or industrial		
Flywheel housing	SAE 1		
Weight	603 lbs approx max (273 kg)		