

Allison Torque Converters

Operators Manual



TC 300
TC 400
TC 500
TC 800
TC 900

OPERATING INSTRUCTIONS

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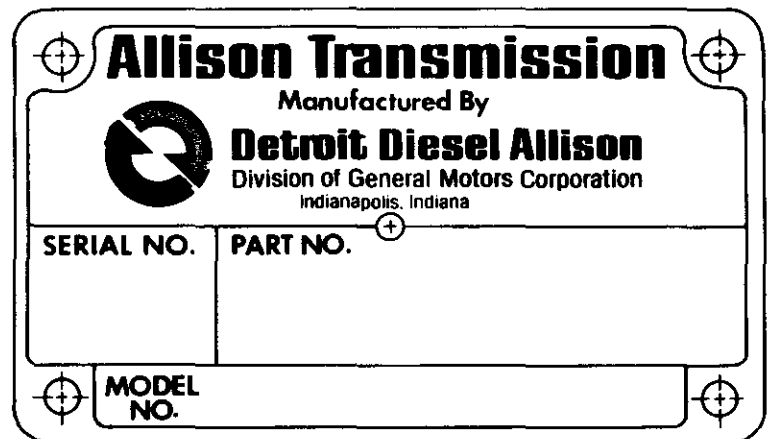
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OPERATING INSTRUCTIONS

TORQUE CONVERTER NAMEPLATE

The nameplate is located on the converter main housing. The model number, part number, and serial number are stamped in the transmission nameplate. These three numbers define the torque converter configuration and all its components. Use *all three* numbers when you are seeking information or ordering replacement parts.



The diagram shows a rectangular nameplate with rounded corners and four mounting holes (indicated by crosshair symbols). The text on the nameplate is as follows:

- Allison Transmission** (Large bold font at the top)
- Manufactured By** (Smaller font below the brand name)
-  **Detroit Diesel Allison** (Logo and brand name)
- Division of General Motors Corporation** (Text below the brand name)
- Indianapolis, Indiana** (Text below the division name)
- A horizontal line separates the header from the data fields.
- SERIAL NO.** (Label for the left data field)
- PART NO.** (Label for the right data field)
- MODEL NO.** (Label for the bottom data field)

For handy reference, record the converter nameplate information onto the nameplate in the illustration.

Model Designation Codes

The model number is an alpha-numeric code that defines the basic torque converter and its major features. The alpha segment of the number defines the major features as illustrated in the Basic Model Code Chart. The numeric segment consists of three significant digits. The first digit defines the torque converter series (size), the second defines the torque absorption capacity and ratio, and the third defines the type of output shaft. (For the TC 300 Series, an additional 3-digit group only further defines, paint color, diameter of input clutch or drive ring, etc.) The part number and serial number define the specific piece parts of the torque converter and any variations not covered by the model number.

Basic Model Code

Series 300	Series 400	Series 500	Series 800	Series 900
TC	TC	TC	TC	TC
TCA	TCA	TCA	TCA	TCA
—	—	TCB	—	—
—	TCD	TCD	TCD	—
—	TCDA	TCDA	TCDA	—
—	TCDO	—	—	—
—	TCDOA	TCDOA	—	—
—	—	—	TCL	TCL
—	—	—	TCLA	TCLA
TCO	—	—	—	—
TCOA	—	—	—	—
TCORD	—	—	—	—
TCRD	—	—	—	—

TC—Torque converter

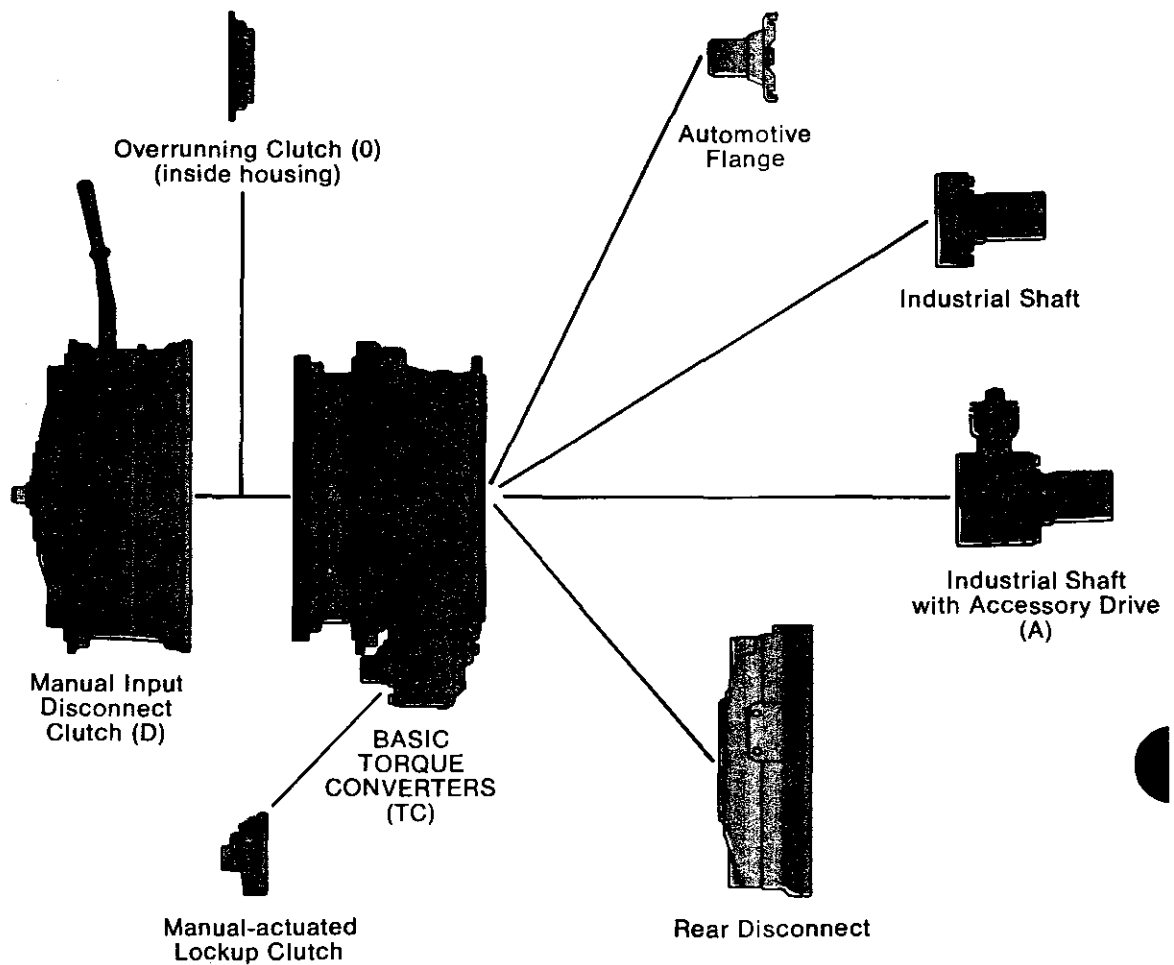
A —Accessory drive

D —Manual input disconnect clutch

L —Lockup clutch

O —Overrunning clutch

RD—Rear Disconnect Housing



OPERATION

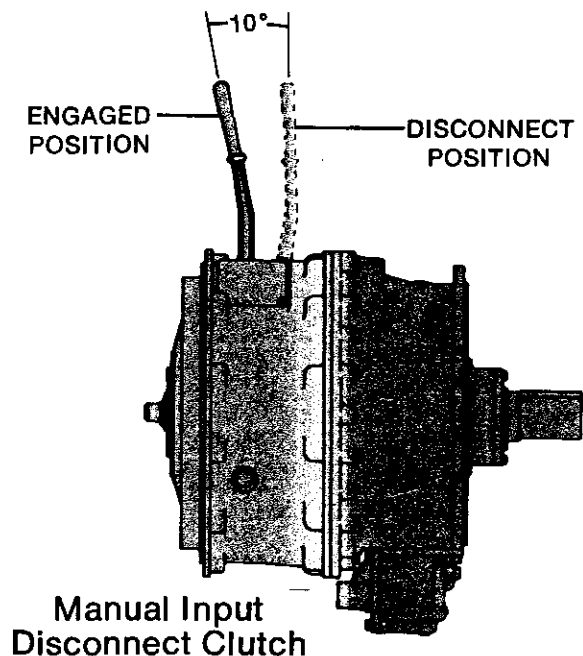
Starting

Check the oil level. A cold check (before engine is started) is necessary to determine if there is sufficient oil in the unit to safely start the engine. This check is especially important if the equipment has not been in operation for a long period of time.

Manual Input Disconnect Clutch

The manual input disconnect clutch is controlled by a single lever. When the lever is forward (toward the engine), the clutch is engaged and provides a positive drive from the engine to the converter. When the lever is rearward (away from the engine) the clutch is disengaged and allows a positive disconnect from the engine. The control lever may be actuated manually or by a hydraulic or pneumatic cylinder. The lever should not be actuated when the engine is above idle speed. Engagement or disengagement above idle speed will shorten the life of the clutch plate and possibly damage the engine.

The clutch should be disengaged for cold weather starts, extended periods of engine idling, engine servicing, or any other time it would be desirable to completely isolate the engine from the driveline.



Lockup Clutch

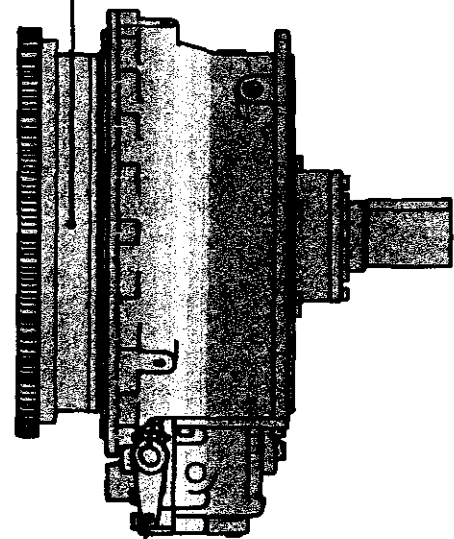
The lockup clutch is controlled by a pneumatic—or manual-operated valve. When the valve is actuated clockwise, a clutch, within the fly-wheel housing, locks the converter pump to the turbine—that is, the input is locked to the converter output. When the valve is actuated counterclockwise the lockup clutch releases.

The lockup clutch should be engaged anytime the equipment will benefit from a direct drive operation. It is particularly beneficial when the clutch can remain engaged for a period of time in a preselected operating range of a transmission.

The lockup clutch should be disengaged before shifting the transmission. The lockup clutch is not designed to withstand the shock loading that accompanies high-load shifting. Failure to disengage the lockup clutch prior to shifts will result in reduced clutch life and possible damage.

NOTE: Movement of the control valve actuator lever should be made rapidly. Slow movement can result in blown converter seals and reduced clutch life.

Lockup Clutch

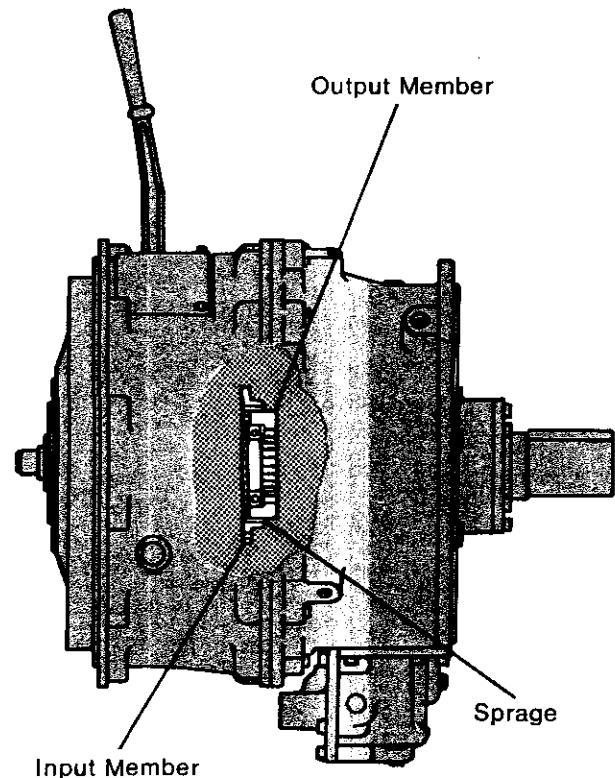


Control Valve
Actuator Lever

Overrunning Clutch

The overrunning clutch is a sprag-type clutch that is controlled by the relative speeds of the input and output shafts. Anytime the output shaft (converter turbine) attempts to overrun the input shaft (converter pump) the clutch engages. The engaged clutch provides full engine braking for the drive line. However, when the speed of the input is greater than the output, the clutch releases. The released clutch allows the converter to perform normally as a torque multiplier and fluid coupling.

Engagement of the overrunning clutch occurs anytime the output attempts to overrun the input. Thus the overrunning clutch provides engine braking for slowing vehicles during downhill runs, lowering loads during crane operations, or any other application where this advantage would be desired.

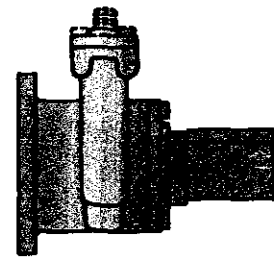


Overrunning Clutch

Accessory Drive

The accessory drive consists of two helical gears which are contained in the rear bearing housing. These gears are driven by the converter output shaft at a 1:25 ratio. Drive from this location can be used to drive a speedometer or serve as a governor drive for the converter output shaft.

The governor drive provides the necessary constant output speed for equipment such as shovels and cranes. The governor drive also prevents harmful engine lugging and stalling



**Accessory Drive
(with industrial shaft)**

Rear Disconnect Clutch Housing

The rear disconnect clutch housing enclose a V-belt hub which is integral with the converter turbine shaft. The shaft is supported by ball bearings within the housing bores. The drive hub of the shaft has six tapped holes to accommodate a clutch plate or other drive accessory. The V-groove in the drive hub provides a belt-type drive for a governor or other similar component.



Rear Disconnect Housing

Temperature

The normal operating temperature range is 180 to 200°F (82 to 93°C). This temperature is indicated by a transmission oil temperature gage on the instrument display panel. When a continuous over-temperature condition, above 250°F (121°C), is indicated, stop the equipment and determine the cause.

The most common and easily remedied cause of overheating is extended operation under severe loads. When this occurs, reduce the load or shift to neutral, and operate the engine at 1200-1500 rpm until temperature returns to normal. If the temperature does not return to normal, refer to the troubleshooting chart in this manual for other possible overheating causes and remedies.

Pushing or Towing

If a disabled vehicle must be pushed or towed farther than ½ mile (0.8 km), it is imperative the drive line be disconnected. Failure to comply with the ½ mile (0.8 km) limit may result in serious damage. If the distance is less than ½ mile (0.8 km), the drive line can remain connected, but the vehicle must travel at a LOW speed.

If the converter is connected to a transmission having an output-driven oil pump, the pump will supply oil to the transmission when the vehicle is being towed or push started.

MAINTENANCE INSTRUCTIONS

PERIODIC INSPECTION

The exterior of the converter should be cleaned and inspected at regular intervals. The severity of service and operating environment should determine the frequency of such inspections. Check the converter for loose bolts, oil leaks, and damaged or loose oil lines. Check the oil level in the reservoir daily. (Refer to paragraph about oil contamination.)

Occasionally check the oil cooling system for evidence of transmission oil which would indicate a faulty oil cooler. Report any abnormal conditions to the maintenance personnel—a faulty cooler requires immediate attention.

Oil Level Checks

The *correct* amount of oil in the reservoir, or transmission sump, is *important* to converter operation. Poor or erratic performance, overheating, and possible damage can occur when the oil level is not within the specified limits.

To ensure that the oil level is properly maintained, two check procedures are recommended—the cold check and hot check. Although different equipment installations have different means of checking—dipstick, level plugs, or petcocks—the procedures remain the same.

Cold Check.

Before starting the engine, check the oil level in the reservoir. If the level is at the Add line, the engine can be started safely. If it is necessary to add oil—DO NOT fill above the Add line.

Hot Check.

After the oil reaches operating temperature 180-200°F (82 to 93°C), idle the engine, and check the oil level. Add or drain oil as necessary to bring the oil level to the Full line. If the converter is equipped with an input disconnect clutch, engage the clutch before making the hot check.

Converter-Transmission Oil Check

If the converter is operating in combination with a transmission, the oil level check will be made at the transmission sump. (Refer to the transmission manual for oil level check procedures.)

Oil Specification

Only Type C-2 hydraulic transmission fluid is recommended for use in these converters.

When the ambient temperature is below -10°F (-23°C), an auxiliary preheat is required to raise the temperature in the sump (reservoir) to at least -10°F (-23°C).

NOTE: Only certain C-2 fluids have been approved for use in Allison converters. Check with the Detroit Diesel Distributor in your area to make sure you are using an approved brand.

Oil and Filter Change

Frequency

Generally, the oil and filter should be changed every 1000 hours of operation. However, if the equipment operates under severe dust and dirt conditions, the oil and filter should be changed more frequently. Change the oil immediately if it has been subjected to severe overheating. Change the oil any time it shows evidence of contamination.



Oil Contamination



Water.

At each oil change examine the oil which is drained for evidence of dirt or water. A normal amount of condensation will emulsify in the oil during operation of the transmission. However, if there is evidence of water, check the cooler (heat exchanger) for leakage between the water and oil areas. Oil in the water side of the cooler (or vehicle radiator) is another sign of leakage. This, however, may indicate leakage from the engine oil system.

Metal Particles.

Metal particles in the Oil (except for the minute particles normally trapped in the oil filter) indicate damage has occurred in the converter. When these particles are found in the sump, the converter must be disassembled and closely inspected to find the source. Metal contamination will require complete disassembly of the converter and cleaning of all internal and external circuits, cooler, filter, and all other areas where the particles could lodge.

Ethylene Glycol.

If engine coolant containing ethylene glycol leaks into the converter oil system, immediate action must be taken to prevent malfunction and possible serious damage. The converter must be completely disassembled, inspected, and cleaned. All traces of the coolant, and varnish deposits resulting from coolant contamination, must be removed.

Draining Oil System

The equipment should be at operating temperature when the oil is drained. While the oil is draining, check for evidence of contamination.

TC 300.

Remove the reservoir (sump) drain plug from the front, lower right hand corner of the converter housing. Remove strainers and filters, if used.

TC 400, 500, 800, 900.

Remove the reservoir (sump) drain plug from the reservoir. To remove the remaining 3 to 4 gallons (11 to 15 liters) from within the converter, remove the converter-in line and start the engine. Run the engine 20 to 30 seconds at 1000 rpm. Remove strainers and filters, if used.

CAUTION: Due to lack of lubrication, do not run the converter more than 30 seconds.

All models.

Clean oil strainers and screens by agitating them in mineral spirits or solvent. Flush all residue and particles from the screen mesh. Dry the strainer or screen with compressed air—do not use linty shop towels.

Should it become necessary to use a different transmission fluid, thoroughly flush the SYSTEM with the fluid to be used before re-filling.

Filling Oil System

All models.

Install reservoir (sump) drain plug and tighten if sufficiently to prevent leakage. Install or replace filters and strainers, if used.

TC 300

Remove the dipstick and pour enough oil into the sump to bring the level to the Add mark. Start the engine and bring the unit to operating temperature, 180-200°F (82-93°C). Check the oil level again and add or drain enough oil to bring the level to the Full mark.

Overcenter Disconnect Clutch

TC 400, 500, 800, 900.

Check to ensure that all drain plugs, oil filters, and oil lines have been installed or replaced and secured sufficiently to prevent leakage. Fill the converter reservoirs with the following volumes of oil—9 gallons (34 liters) in the TC 400 and 500 Series; 8 gallons (30 liters) in the TC 800 and 900 Series. Start the engine and bring the unit to operating temperature, 180-200°F (82-93°C). Check the oil level again and add or drain enough oil to bring the level to the Full mark.

Lubrication.

Lubricate the throw-out bearing and shaft bearing with high-temperature grease (300°F [150°C] minimum melting point) every 60 hours of operation. This time interval may vary due to specific operating conditions. Using a grease gun inject 1 "shot" into each grease fitting located on the top of the clutch housing.

CAUTION: Overlubrication of either bearing will cause grease to be thrown onto the clutch facing, causing the clutch to slip or grab.

Adjustment.

Occasionally, it will be necessary to adjust the clutch to compensate for normal wear. This check should be made every 500 hours of operation or more frequently, depending on frequency of operation and operating conditions.

The clutch requires adjustment if the force required to operate clutch control lever through the "overcenter" position is not within the limits shown in the adjustment chart.

Series	Engine horsepower, (kw) net	Force, lb (N)	Control lever distance, in. (mm)	Adjustment rotation to increase force
TC 300		40-45 (178-200)	16 (406.4)	CCW
TC 400, 500	below 240 (179)	55-75 (245-334)	21 (533.4)	CW
	240 to 350 (179 to 261)	75-115 (234-512)	21 (533.4)	CW
		115-175 (512-778)	24 (609.6)	CW

If a pneumatic or hydraulic cylinder is used to operate the clutch control lever, be sure that the cylinder stroke does not overload the apply and release mechanism. Increasing the stroke for a "harder" apply will not affect engagement pressure.

Overloading at either end of the stroke will only result in excessive wear in the mechanism.

TC 300.

Remove the access cover and disconnect the clutch. Rotate clutch assembly until the lock screw is accessible. Remove the lock screw and lock from the adjusting nut. Using a spanner wrench (or drift and hammer) rotate the adjusting nut counterclockwise (facing engine flywheel) to increase the engagement force. Refer to adjustment chart for the force value. Replace the lock and lock screw, and replace the access cover.

TC 400.

Remove the access cover and disconnect the clutch. Rotate the clutch assembly until the collar lock pin is accessible. Remove the lock pin and rotate the adjustment collar and toggle assembly clockwise (facing engine flywheel) to increase the engagement force. Refer to adjustment chart for the force value. Replace the lock pin, making sure the pin has engaged one of the 24 holes in the hub plate. Failure to engage the pin securely will allow the clutch to lose adjustment.

TC 500, 800, 900.

Remove the access cover and disconnect the clutch. Rotate the clutch assembly until the adjustment collar lock is accessible. Press the lock with the thumb, and rotate the toggle assembly clockwise (facing engine flywheel) to increase the engagement force. Refer to adjustment chart for the force value. Release the lock, making sure it is engaged in one of the 24 slots in the clutch hub. Failure to engage a slot securely will allow the clutch to lose adjustment.

Oil Seal Drain Line

TC All models.

The means to lock or unlock the toggle mechanism may vary within the design of the disconnect clutch. It may, therefore, be necessary to adopt procedures other than those described.

Carbon Buildup.

On all Series, remove the oil seal drain line periodically and check for carbon buildup. If any carbon is evident, remove the deposit, and reinstall the fitting and drain line.

Excessively high converter operating temperatures will sometimes cause carbon deposits to occur in the hydraulic system. Accumulation of these particles in the drain line will restrict the flow sufficiently to cause a pressure buildup at the pump hub seal. This pressure will result in leakage and subsequent failure of the seal.

Periodically check the drain hole in the engine flywheel housing for an indication of leakage from the pump hub seal.

Correct Routing.

The drain line must be routed so that every point in the line is more than 3½ inches (89 mm) below the center line of the converter. The line must be kept free of kinks and tight bends. An incorrect routing will result in leakage at the pump hub seal or output shaft seal.

TROUBLESHOOTING

The operator must be alert to evidences of performance of the equipment. In some cases, the remedy may be beyond the on-site technical skills or tool inventory. When this occurs, report the condition to the appropriate maintenance personnel as soon as possible—don't let little problems become big ones.

The following chart lists the possible causes of, and remedies for, converter troubles. As indicated in the chart, the engine and converter must be considered as a single package when searching for the trouble.

Cause	Remedy
Ⓐ LOW CONVERTER CHARGING PRESSURE	
1. Low oil level	1. Add oil to correct level
2. Defective oil pump	2. Repair or replace
3. Excessive oil flow to transmission*	3. Check operation of selector valve, check valve, and transmission charging pump
4. Clogged inlet line or screen*	4. Clean or replace inlet line or screen
5. Suction screen uncovered*	5. Add oil to correct level or check for incorrect installation of screen
6. Leaking oil lines	6. Replace defective lines, gaskets; tighten fittings, gasket bolts
7. Aerated oil	7. Refer to Ⓒ

*Does not apply to the TC 300 Series Converters.

Cause	Remedy
Ⓑ HIGH OIL TEMPERATURE	
1. Incorrect oil level	1. Add or drain oil, as necessary
2. Engine coolant overheated	2. Correct engine overheating
3. Clogged or dirty heat exchanger	3. Clean or replace
4. Low converter charging pressure	4. Refer to Ⓐ
5. Operating too long in an inefficient converter range	5. Readjust work cycle
6. Stator(s) malfunctioning	6. Repair or replace stator(s)
Ⓒ AERATED (foaming) OIL	
1. Oil return line above oil level in sump	1. Place end of return line below oil level
2. Air entering suction side of charging pump	2. Check oil pump bolts, gasket, and sealing surfaces
3. Suction screen uncovered*	3. Check for correct installation of suction screen; add oil to correct level
4. Low oil level	4. Add oil to correct level
Ⓓ LOSS OF POWER	
1. Low converter charging pressure	1. Refer to Ⓐ
2. Engine malfunctioning	2. Check engine; refer to engine service manual
Ⓔ LOCKUP CLUTCH SLIPPAGE	
1. Incorrect linkage adjustment to lockup selector valve	1. Adjust linkage
2. Lockup selector valve malfunctioning	2. Repair or replace selector valve
3. Failed or worn lockup piston sealrings	3. Replace sealrings
4. Stoppage in pump-to-piston apply passage	4. Clean passage and remove obstruction
5. Worn lockup clutch plate	5. Replace clutch plate
Ⓕ INPUT DISCONNECT CLUTCH SLIPPAGE	
1. Clutch facing worn	1. Adjust clutch; replace clutch facing
2. Grease on clutch facings	2. Disassemble and clean converter; replace clutch facings

PRESERVATION AND STORAGE

Preservative Method Selection

When the converters are to be stored or remain inactive for extended periods of time, specific preservative methods are recommended to prevent rust and corrosion damage. The length of storage will usually determine the preservative method to be used.

Storage

Four to Six Weeks

This procedure will preserve a converter for four to six weeks depending upon the environment.

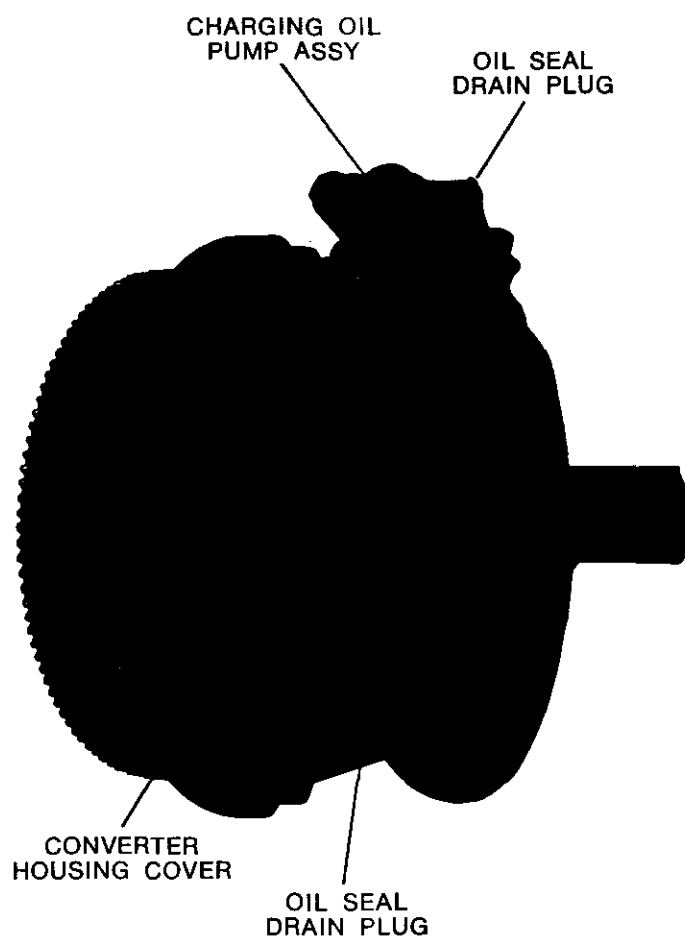
- Drain the oil and remove the oil filter(s). Install the drain plug and new oil filter(s).
- Fill the unit to operating level with any commercial preservative oil which meets US Military Specification MIL-L-21260, grade 1, to latest specifications.
- Operate the unit for at least 5 minutes at a minimum of 1000 rpm. If the unit is equipped with a lockup clutch, actuate the lockup selector valve. Then, stall the converter to raise the oil temperature to 225°F (107°C). (To stall the converter, prevent rotation of the output shaft.)

CAUTION: Do not allow the temperature to exceed 250°F (121°C). If the unit does not have a temperature gage, do not stall for more than 20 seconds.

- As soon as the unit is cool enough to touch, seal all openings and breather with moisture-proof tape. Coat all exposed, unpainted surfaces with a good grade of preservative grease, such as a petrolatum that meets US Military Specification MIL-C-11796, Class 2.
- For indefinite storage, at monthly intervals, repeat the operating procedure and reapply the preservative grease.

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- Drain the oil.
- Seal all openings and breather, except oil drain hole, with moisture-proof tape. Coat all exposed unpainted surfaces with a good grade of preservative grease.
- Atomize or spray 2 ounces (59 ml) of Motorstor*, or equivalent, into the converter. For the TC 300 Series converters, spray the preservative into the drain hole at the bottom of the sump. For the rest of the converters, spray the preservative into the unused oil seal drain hole, i.e., opposite the oil seal drain line fitting. Install the drain plug.



S1215

- If additional storage time is required, re-apply the preservative grease, and spray 2 ounces (59 ml) of Motorstor (or equivalent) into the specified opening. Repeat at yearly intervals.

One Year Storage— With Oil

- Drain the oil and remove the oil filter(s). Then, install the drain plug and new filter(s).
- Fill the converter reservoir (sump) with a mixture of 30 parts of transmission fluid, Type C-2, to 1 part Motorstor preservative, or equivalent.
- Operate the unit for at least 5 minutes at a minimum of 1000 rpm. If the unit is equipped with a lockup clutch, actuate the lockup selector valve. Then, stall the converter to raise the oil temperature to 225°F (107°C). (To stall the converter, prevent rotation of the output shaft.)

CAUTION: Do not allow the temperature to exceed 250°C). If the unit does not have a temperature gage, do not stall for more than 2 seconds.

- As soon as the unit is cool enough to touch, seal all openings and breather with moisture-proof tape. Coat all exposed, unpainted surfaces with a good grade of preservative grease.
- If additional storage time is required, replace any lost fluid, repeat the operating procedure, and reapply the preservative grease.

Restoring Units to Service

If Motorstor, or equivalent, was used in preparing the converter for storage, use the following procedures to restore the unit to service.

- Remove the tape from the openings and breather. Wash off all external grease with solvent.
- Add Type C-2 hydraulic transmission fluid to the proper level.

NOTE: It is not necessary to drain the C-2 oil and Motorstor mixture from the converter.

If Motorstor, or equivalent, was not used in preparing the converter for storage, use the following procedures to restore the unit to service.

- Remove the tape from openings and breather. Wash off all external grease with solvent, and drain the oil.
- Install a new oil filter(s), and refill the reservoir (sump) with Type C-2 hydraulic transmission fluid to the correct level.

*Motorstor is a preservative additive manufactured by the Daubert Chemical Company, Chicago, Illinois. Motorstor (under the designation of "Nucle Oil") is covered by US Military Specifications MIL-L-46002 (ORD) and MIL-I-23310 (WEP).

SERVICE LITERATURE

The following publications describe the operation, servicing, overhaul, and replacement parts for your torque converter. These publications can be obtained from the dealer or distributor.

Service Manuals TC 200, TC 300 TC 400 TC 500 TC 800, TC 900	Publication No. SA 1099 SA 1136 SA 1058 SA 1054
Parts Catalog TC 200, TC 300 TC 400 TC 500 TC 800, TC 900	Publication No. SA 1039 SA 1116 SA 1057 SA 1038

The Allison Torque Converter



Detroit Diesel Allison

Indianapolis, Indiana 46206



Date March, 1977 No. 60, Rev. G

TC-300 CONVERTER

I. Introduction

The TC-300 Series Torqmatic Converter is one of the most versatile products in the Allison line. Backhoes, cranes, ditchers and trenchers, draglines, earth augers, material handling equipment, motor graders, rail switchers, shovels, log skidders, tow tractors, utility trucks and winches and hoists are examples of the many applications for this unit. 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.

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

When the four element TC-300 Series models were replaced by the new three element units, the TC-330 and TC-320 models were obsoleted. The TC-300 Series now offers a TC-350 model replacing the old TC-320 and the new TC-370 model.

The input ratings for the TC-300 Series converter are as follows:

	<u>TC-350</u>	<u>TC-370</u>
Maximum Input Speed (RPM)	3000	3000
Maximum Input Torque (lb.ft.)	280	360
Maximum Input Torque (Nm)	380	488
Gross Engine HP Range	80-150	80-150
Gross Engine HP Range (kilowatts)	60-112	60-112

II. Product Description

1. Direct Engine Mounting

The TC-300 Converter Series has a SAE #3 flywheel housing. An SAE #2 to SAE #3 housing adapter, P/N 5174287 is available from Detroit Diesel Allison Division.

Flex Disc Drive is optional for TC-300 models. The type of flex disc is dependent on the engine model.

Greased Gear Drive is presently standard on the TC-300 Series converters.

2. Converter Elements

All TC-300 industrial converters are three element, two phase, single stage models with the following stall torque ratios available.

<u>Model</u>	<u>Stall Torque Ratio</u>
TC-350	3.09
TC-370	2.47

3. Output Shaft:

Both industrial and automotive output shafts are available with or without an optional rear output disconnect clutch. The preference of output shafts makes these models adaptable to a variety of applications.

The industrial shaft is available with standard duty tapered bearings, with extra duty tapered bearings, as well as with bevel pinion mounting.

The model designations with various output configurations are as follows:

<u>Output</u>	<u>Model</u>
Automotive	TC-XX4
Industrial with Standard Bearing	TC-XX5
Industrial with Heavy Duty Bearing	TC-XX7
Industrial with Bevel Pinion Mounting	TC-XX8

4. Input Inertia Valves

<u>TC Model</u>	<u>No Lock-Up</u>		<u>With</u>	
	<u>lb.ft. sec²</u>	<u>KgM²</u>	<u>Disconnect Clutch</u>	<u>lb.ft.sec² KgM²</u>
TC-300	.224	.304	add .256	add .347

III. Optional Equipment

- The optional equipment available on the TC-300 Series Converter is listed below.

<u>Available Option</u>	<u>TC-300</u>
Governor Drive (TCA-XXX)	X
Overrunning Clutch (TCO-XXX)	X
Rear Disconnect Clutch (TCRD-XXX)	X
Automotive Output (TC-XX4)	X
Industrial Shaft - Standard (TC-XX5)	X

<u>Available Option</u>	<u>TC-300</u>
SAE #3 Rear Disconnect Clutch Housing (TC-XX6)	X
Industrial Shaft - Extra Duty Bearings (TC-XX7)	X
Industrial Shaft-Bevel Pinion Mounting (TC-XX8)	X
SAE #2 Rear Disconnect Clutch Housing (TC-XX9)	X
Manual Input Disconnect Clutch Housing (TC-300 Ring Gear Drive Units Only)	
SAE #2 Housing	X
SAE #3 Housing	X
10" Input Clutch Assembly	X
Oil Cooler	X
Accessory Cable Drive Adapter	X
Rear Disconnect Adapter (Service Part Only)	X
Overrunning Clutch and SAE #3 Rear Disconnect (TCORD-XX6)	X
Overrunning Clutch & SAE #2 Rear Disconnect (TCORD-XX9)	X
Overrunning Clutch & Accessory Drive (TCOA-XX7)	X

The model designation for the above options is included in the basic model number as shown. There are, however, additional options which are designated as dash numbers following the basic model number. For example, a TCA-307 is a TC-300 Series industrial converter with accessory drive (TCA) and an industrial shaft with extra duty bearings (TCA-XX7). The dash number options available are listed below.

<u>Dash Number</u>	<u>Option</u>
102	TC-300 Series Oil Cooler
116	TC-300 Series SAE 2 Input Disconnect Clutch Housing (less clutch)
117	TC-300 Series SAE 2 Input Disconnect Clutch Housing and Clutch
118	TC-300 Series SAE 2 Input Disconnect Clutch Housing (less clutch) and Oil Cooler
119	TC-300 Series SAE 2 Input Disconnect Clutch Housing, Clutch, and Oil Cooler
120	TC-300 Series SAE 3 Input Disconnect Clutch Housing (less clutch)
121	TC-300 Series SAE 3 Input Disconnect Clutch Housing and Clutch
122	TC-300 Series SAE 3 Input Disconnect Clutch Housing (less clutch) and Oil Cooler
123	TC-300 Series SAE 3 Input Disconnect Clutch Housing, Clutch, and Oil Cooler
127	TC-300 Accessory Drive Cable Adapter
132	TC-300 Series SAE 3 Input Disconnect Clutch Housing, Clutch, and Cable Drive Adapter
144	TC-300 Series SAE 3 Roller Bearing Input Disconnect Housing, Clutch and Cable Drive Adapter
145	Same as - 123 plus Access. Drive Cable Adapter
146	Same as - 121 plus Roller Bearings

2. Input Disconnect Clutch:

The overcenter type disconnect clutch is available only for TC-300 ring gear drive units when the application requires a positive disconnect of engine power from the converter. The clutch is a standard dry type, 10 inch (254 mm) design. A complete clutch assembly or individual clutch parts may be purchased as spare parts.

3. Overrunning Clutch (TCO Models):

The overrunning clutch is available for TC-300 greased gear drive models only. 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.

4. Accessory Drives (TCA Models):

Accessory drive provision adequate for tailshaft governor or speedometer drive gears is available on industrial shaft models only and may be either cable drive or direct mounted.

5. Adapter Kits for PTO Type Clutches:

Many applications require an overcenter type PTO clutch arrangement. Allison has available, an adapter kit, Part No. 6756685, which is used with the rear disconnect housing to adapt to a 10" (254 mm) or 11-1/2" (292 mm) PTO clutch. A clutch manufacturer must make the recommendation as to the capacity and size clutch based on the individual installation and application. The following list of available PTO clutches that can be used with the Allison adapter is for information purposes only and is not a recommendation.

<u>Manufacturer</u>	<u>Model</u>	<u>PTO No.</u>	<u>Clutch Size</u>
Twin Disc	X-8249	C-110	10" (254 mm)
Twin Disc	X-9619	SP-111	11-1/2" (292 mm)
Twin Disc	X-9582	SP-111	11-1/2" (292 mm)

6. Standard Flywheels and Clutches:

Certain standard flywheels and clutches will mate directly to the stub shaft in the rear disconnect housing without modification. The following list includes the manufacturer, adapter or flywheel part number, the clutch to which they adapt, and the minimum rear disconnect housing size. The clutches listed below are standard spring loaded automotive type clutches.

Continental

<u>Type</u>	<u>Part No.</u>	<u>Adapter Clutch</u>	<u>R.D. Hsg. Min. Size</u>
Flywheel	M600C-405	Rockford 12TT	
Flywheel	M600C-337	Rockford 11TT	#3
Flywheel	M600C-403	Rockford 14TT	#3
Flywheel	F600C-305	10A-7 Borg & Beck	#3
Flywheel	F600C-320	10A-6 & 11A-6 Borg & Beck	#3
Flywheel	K600C-401	12E & 13E Borg & Beck	#3
Flywheel	M600C-413	13E Borg & Beck	#3
Flywheel	M271C-303	Twin Disc 5738 C-10	#3
Flywheel	M600C-400	Twin Disc B-11 1/2 G.T.	#3
Flywheel	M330C-200	Twin Disc C-10 G.T.H.D.	#3
Flywheel	M330C-400	Twin Disc. C-10 G.T. Std.	#3
Flywheel	B427C-410	14" (355 mm) Lipe-Rollway	#3
		140-1-509	
Flywheel	R600C-455	15" (381 mm) W.C. Lipe-Rollway	#2
Flywheel	X749C-400	15" (381 mm) Lipe-Rollway,	
		2 Plate Clutches 2-38-S & Z15-6	#2
		O.D. Must be Machines	
Adapter	TC-20C-300	Borg & Beck 11A6	#3
Adapter	TC-20C-301	Borg & Beck 12E & 13E	#3
Adapter	TC-20C-302	Lipe-Rollway 13ML	
Adapter	TC-20C-400	Lipe-Rollway 12 ML	#3
Adapter	TC-20C-401	Twin Disc CLD G.T. or Rockford	#3

Hercules

Flywheel Z4986-C Lipe-Rollway 13ML

The above flywheels and adapters are not recommendations but are for information only. Additional manufacturers and models will be added as we learn of them. These components are not available from Allison and should be ordered from the individual manufacturers.

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

7. Greased Gear Drive Kit (TC-300)

A greased gear drive kit, P/N 6775458, is available to convert earlier TC-300 models to the gear drive. This kit includes a drive ring, P/N 6775414, a seal, P/N 6769818, bolts, P/N 9412270, and a container of grease, P/N 6769877.

8. Specifications and Ratings:1. Dry Weight* (Approximate):

<u>Model</u>	<u>Weight (lbs.)</u>	<u>Weight (kg)</u>
TC-300	202-302 lbs.	92-137 kg

*Dependent on model.

2. Oil System:

Oil Type - Hydraulic Transmission Fluid, Type C-3

Charging Pump Capacity -

at 1800 RPM (TC-300) 12 GPM (45.42 Liters/Min.)

Converter-Out Pressure -

(Full Throttle Stall) (TC-300) 25-40 PSI (17225-27560 kPa)

Converter-Out Pressure

60 PSI (41340 kPa)

(Full Throttle No Load)

Converter Oil Outlet Max. Temperature - 250°F. (121.1°C)

Oil Capacity - 10 qts. (9.46 Liters)

9. Reference:1. Sales Briefs:

<u>Number</u>	<u>Subject</u>
9	Temperature and Pressure Gauges
42	Oil Recommendations
56	Paint Specifications

2. Manuals and Catalogs:

<u>Publication</u>	<u>SA Number</u>
TC-300 Service Manual	SA-1099
TC-300 Parts Catalog	SA-1039
Operators Manual	SA-1405

3. Quick Match Charts:

<u>Match Chart</u>	<u>SA Number</u>
TC-350	SA-1173
TC-370	SA-1175

4. Installation Drawings:

<u>Drawing No.</u>	<u>Subject</u>
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	Flex Plate Input Drive Data
AS 00-036	Flex Drive Characteristics
AS 31-001	Basic Installation Drawing
AS 31-003	Cooler Oil Flow (TC-300)
AS 31-004	Installation Diagram (TCO-300)
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

If there are any questions, please contact the Transmission Sales Department, Detroit Diesel Allison, GMC, P.O. Box 894, Indianapolis, Indiana 46206, (Speed Code J5).

17-428, 889



TC-400-500 SERIES CONVERTERS

I. INTRODUCTION

The Allison TC-400-500 Series Torqmatic Converters are three element, two phase, single stage converters designed for industrial or automotive applications in the 150-400 gross HP range. Typical applications include shovels, cranes, draglines, backhoes, motor graders, winches and hoists, drilling rigs, snowplows, oil field equipment, rock crushers, ski tows and rail switchers.

The power input ratings for the TC-400 and TC-500 Series Converters are as follows:

	<u>TC-400</u>	<u>TC-500</u>
Maximum Input Torque (Lb. Ft.)	615	865
Maximum Input Torque (Nm)	834	1173
Maximum Input Speed (RPM)	3000	2500
Gross Engine HP Range	150-250	200-400
Gross Engine HP Range (kW)	112-186	149-298

II. PRODUCT DESCRIPTION

The TC-400 and TC-500 Series Converters are matched to and available for use with a wide variety of gasoline and diesel engines. Listed below are the various TC-400 and TC-500 Series Models and their respective stall torque multiplication ratios:

<u>Model</u>	<u>Stall Torque Ratio</u>
TC-430	3.55:1
TC-450	3.20:1
TC-470	3.04:1
TC-530	3.58:1
TC-540	2.95:1
TC-550	3.43:1
TC-560	2.74:1
TC-570	3.26:1
TC-580	2.67:1

The torque converter elements are contained in a cast iron housing. The converter charging pump is bolted to the outside diameter of the housing

and may be easily removed for servicing. The converter housing may be rotated in any position providing the external charging pump remains at least 30° above or below the centerline of the converter.

The engine driven converter charging pump may be used to supply oil pressure to a hydraulic transmission in addition to providing oil for the torque converter. A valve assembly on the charging pump cover regulates transmission pressure. A second valve assembly on the cover regulates converter pressure.

The oil reservoir for a TC-400-500 Series converter is not a part of the basic assembly and must be customer supplied.

III. OPTIONAL FEATURES

A wide variety have been designed for use with the TC-400-500 Series Converters in order to broaden their use in a variety of applications. Options that are available for both the TC-400 and TC-500 Series are:

- A. Industrial Shaft Output - Key way provided for sprocket drive.
- B. Industrial Shaft with Accessory Drive - The accessory drive option used with the industrial shaft output configuration provides a drive for either a direct mounted or cable driven tailshaft governor assembly.
- C. Automotive Output - An automotive flange output is available on the TC-400-500 Series. A variety of flanges, including Spicer, Mechanics, and Cleveland Almetal, are available. Refer to AS 00-012 for flange model and dimensional information.
- D. Manual Input Disconnect Clutch - A dry type overcenter manual input disconnect clutch is available to provide positive disconnect between the engine and the torque converter.
- E. Manual Input Disconnect with Overrunning Lockup Clutch - The overrunning lockup clutch with input disconnect is a desirable option combination for cranes, draglines, and shovels. The overrunning lockup 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.
- F. Torqmatic Brake - The Torqmatic brake option is available only on the TC-500 Series Converters. The Torqmatic brake option consisting of a rotor, vaned housing, and control valve assembly is added to the output shaft end of the torque converter. The Torqmatic brake can be used effectively to slow down the converter output shaft when the vehicle is descending a grade. By applying the control valve, the vehicle operator can fill the main housing area around the spinning rotor with transmission fluid. Resistance of the spinning rotor against the fluid causes the rotor and converter output shaft to which it is

splined, to slow down. The Torqmatic brake can absorb up to 384 HP at maximum rated RPM. However, the total amount of HP that can safely be absorbed by the Torqmatic brake is dependent upon customer supplied cooling system that must dissipate the heat generated by the brake rotor and the various driveline components.

IV. SPECIFICATIONS AND DATA

A. Mounting - Engine mounted only. SAE #1, flex disc drive. Rear support plate required to support full sprocket side load pull on industrial shaft output models. Refer to AS 00-008.

B. Dry Weight *In Lbs. Approx.

<u>Models</u>	<u>Weight*</u>
TC-400 Series	400-583 lbs. (181-264 kG)
TC-500 Series	420-650 lbs. (191-295 kG)

*Dependent on options.

C. Oil System

Oil Type - Hydraulic Transmission Fluid Type C-3

Sump Capacity - 10 U.S. Gallons (customer supplied)

Temperature - 250°F. Maximum Converter Out (121.1°C)

Filter - Recommended for use in cooler circuit

Filter Screen in sump required - refer to AS 51-004.

Oil Lines - *Pump Suction - 1 1/8 in. I.D.

*Converter Out - 5/8 in. I.D.

*Seal Drain - 13/32 in. I.D.

*Refer to AS 51-004 for plumbing diagram.

D. Instrumentation

Temperature Gauge - Required. Refer to Sales Brief No. 9.
or AS 51-004.

Pressure Gauge - Optional.

E. Permissible Sprocket Pitch Diameter with Industrial Shaft Output -
Refer to AS 51-009.

V. ADDITIONAL REFERENCE MATERIAL

A. Sales Briefs

<u>No.</u>	<u>Subject</u>
9	Temperature & Pressure Gauges
42	Oil Recommendations

<u>No.</u>	<u>Subject</u>
56	Paint Specification
65	Driveline Angularity

B. Manuals and Catalogs

<u>SA No.</u>	<u>Publication</u>
SA-1136	TC-400 Service Manual
SA-1058	TC-500 Service Manual
SA-1116	TC-400 Parts Catalog
SA-1057	TC-500 Parts Catalog
SA-1405	Operators Manual

C. Match Charts

<u>SA No.</u>	<u>Converter Model</u>
SA-1176	TC-430
SA-1177	TC-450
SA-1178	TC-470
SA-1198	TC-530
SA-1199	TC-540
SA-1200	TC-550
SA-1201	TC-560
SA-1202	TC-570
SA-1203	TC-580

D. Installation Drawings

<u>Drawing No.</u>	<u>Subject</u>
AS 00-001	Converter Drive Adaption
AS 00-002	Engine-Converter Adaption Requirements
AS 00-008	Recommended Support Construction
AS 00-012	Drive Flange Chart
AS 51-004	External Hydraulic Circuit Spec.
AS 51-001	Cooler Oil Flow TC-500 Series
AS 51-002	Brake Absorption Curve
AS 51-003	Installation Diagram
AS 51-005	External Hydraulic Circuit with Trans.
AS 51-006	Hydraulic Retarder Option
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

E. Installation Manual Off-Highway Transmissions

Detroit Diesel Allison Division, General Motors

For further information, contact the Transmission Sales Department,
Detroit Diesel Allison Division of General Motors, Post Office Box
894, Indianapolis, Indiana 46206.



Date March 1977 No. 59D

TC-800 AND 900 TORQMATIC CONVERTERS

I. Introduction

The TC-800 and 900 Series converters are the highest capacity Allison converters for industrial applications. These converters cover the 300 to 600 gross engine horsepower range and are presently used in the following applications: backhoes, winches and hoists, drilling equipment, oil field equipment, pump drives, rail equipment, and rock crushers.

The TC-800 and 900 Series converters are all four element, single stage, three phase converters with stator freewheel. Other standard features of this series are cast aluminum components, integral charging pump, flex disc drive, and a choice of either an automotive or industrial output.

The power input ratings for the TC-800 and 900 Series converters are as follows:

	<u>TC-800</u>	<u>TC-900</u> <u>Std. Pump</u>	<u>TC-900</u> <u>Large Pump</u>
Maximum Input Torque (lb.ft.)	1065	1065	1470
Maximum Input Torque (Nm)	1444	1444	1993
Maximum Input Speed (RPM)	2100	2100	2100
Gross Engine HP Range	300-400	300-400	350-600
Gross Engine HP Range (kW)	224-298	224-298	261-447

II. Product Description

A. Direct Engine Mounting

The TC-800 and 900 Series converters are engine mounted with flex disc drive. The standard flywheel housing is an SAE 1/2 with an SAE 0 to 1/2 adapter available. Specific adapter models and ring gears depend on the type of engine.

B. Torque Converter Elements

The TC-800 and 900 Series Torqmatic converters are available in four basic element models. The stall torque ratios of these models are as follows:

<u>Model</u>	<u>Stall Torque Ratio</u>
TC-840	2.92
TC-850	3.98
TC-940	2.71
TC-950	3.67

C. Output Shafts

The TC-800 and 900 Series converters offer a choice of output shafts, either automotive or industrial. The automotive shaft is available with Mechanics or Spicer flange option. The industrial shaft is available with or without accessory drive.

D. Charging Oil Pump

The 24.5 GPM (1.55 liters) charging pump is standard on the TC-800 and TC-900 Series converters. An optional 40 GPM (2.52 liters) is required on certain higher horsepower engines with the TC-900 converter.

III. Optional Equipment

- A. The following options are available on the TC-800 and 900 Series are designated.

	<u>TC-800</u>	<u>TC-900</u>
Automotive Output (TC-XX4)	X	X
Industrial Output (TC-XX5)	X	X
Governor Drive (TCA-XX5):		
Direct Mounted	X	X
Cable Adapter	X	X

B. Output Flanges (TC-XX4 Models Only)

The automotive output TC-800 and 900 models have the following output flanges available:

1. Mechanics 7C
2. Spicer 1700
3. Spicer 1800

C. Sprocket Selection (Customer Furnished)

The selection of the proper sprocket for chain drives, pulleys, and "V" drives can be determined from the sprocket load chart, AS 81-007. Chain drive sprocket diameters may be read directly off the chart. For "V" belt drives, the minimum pulley pitch diameter is equal to 1.5 times the minimum sprocket pitch diameter. The following directions are provided to simplify the use of the sprocket load chart, AS 81-007.

1. Determine the distance in inches from the housing to the center line of the load. Find the vertical line on the right side of the chart which is indicative of that value.

2. Determine the point at which that line intersects the "minimum" curve.
3. Extend intersection point (Item #2) horizontally to the left unit it meets with the diagonal line representative of the correct converter torque output in lb.ft.
4. Extend intersection point (Item #3) vertically downward until it intersects the minimum sprocket P.D. scale. Read the minimum sprocket P.D. at this point.

NOTE: Any sprocket larger than the minimum size will work efficiently. Sprockets other than those recommended will result in excessive bearing load and correspondingly less bearing life.

IV. Specifications and Ratings

A. Dry Weight in Lbs. (Approximate)

698 to 815 lbs. (317 to 370 kg), depending on the model configuration.

B. Oil System

Main pressure - 140-170 PSI

Converter - in oil pressure at operating temperature 200°F to 250°F.

@ full throttle stall - 60-90 PSI

@ full throttle no load - 120 PSI

Converter oil outlet max. temperature - 250°F. (121.1°C)

Oil type - Hydraulic transmission fluid Type C-3

Converter oil capacity - see AS 81-003

V. References

A. Sales Briefs

A. Sales Briefs

<u>Number</u>	<u>Subject</u>
9	Temperature and Pressure Gauges
42	Oil Recommendations
56	Paint Specifications

B. Manuals and Catalogs

<u>Publication</u>	<u>SA Number</u>
TC-800 & 900 Service Manual	SA-1054
TC-800 & 900 Parts Catalogs	SA-1038
Operators Manual	SA-1405

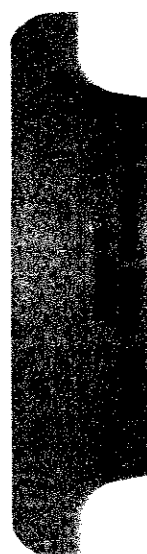
C. Quick Match Charts

<u>Model</u>	<u>SA Number</u>
TC-840	SA-1182
TC-850	SA-1183A
TC-940	SA-1184
TC-950	SA-1185A

D. Installation Drawings

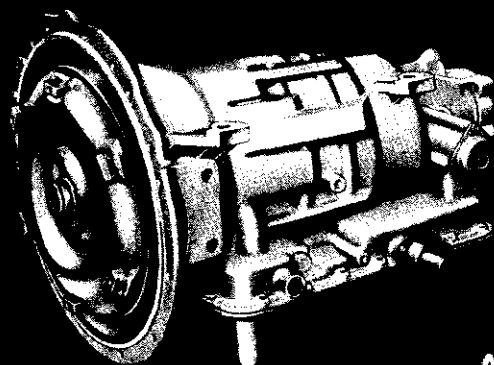
<u>AS Number</u>	<u>Subject</u>
AS 00-002	Engine Transmission/Converter Adaptation Requirements
AS 00-008	Recommended Support Plates
AS 00-012	Output Flange Options
AS 00-013	Pump Suction Screen
AS 00-015	Physical Adaptation Chart
AS 81-002	Cooler Oil Flow
AS 81-003	External Hydraulic Circuit (TCHD 800-900)
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

If there are any questions, please contact the Transmission Sales Department, Detroit Diesel Allison, Division, GMC, P. O. Box 894, Indianapolis, Indiana - 46206.



Allison Transmissions automatic models

AT 540
up to 235 hp
(175 kW)



AT 540

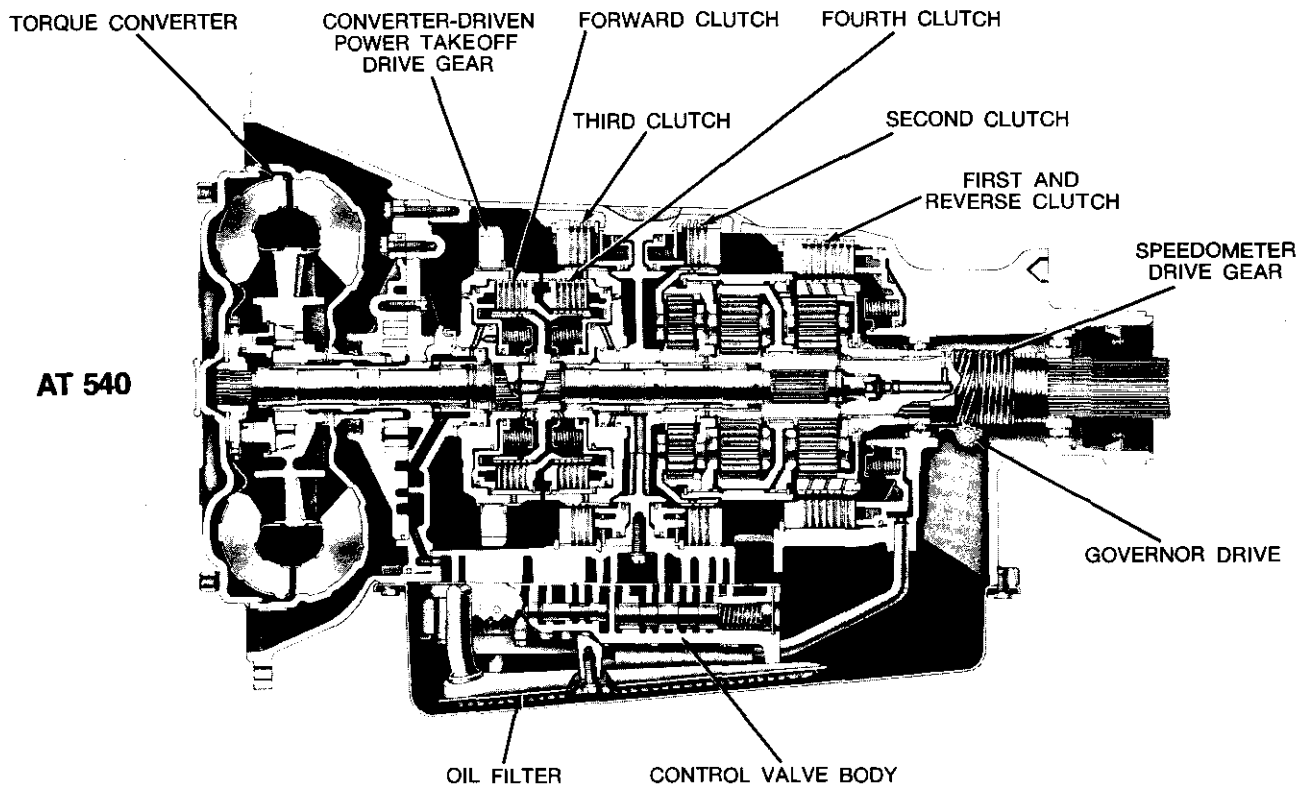
specifications

rating	Net input power Input speed, full-load governed Net input torque Vehicle weight	235 hp (175 kW) (max) 2400-3200 rpm (diesel); 3200-4000 rpm (gasoline) 385 lb ft (522 N•m) (max) 10,000 to 36,000 lbs (4,536-16,329 kg) GVW and up to 50,000 lbs (22,680 kg) GCW
mounting	Engine Vehicle	SAE 3 flywheel housing with flex disk drive One vertical mounting pad each side
torque converter	Type Stall torque ratio	Single-stage, 3-element, multiphase 2.0
gearing	Type Gear ratios: First Second Third Fourth Reverse	Constant mesh, spur type, planetary 3.45 2.25 1.41 1.00 5.02
power takeoff drive gear (optional on gasoline)	Type Size of opening Location Ratio Rating	Converter driven SAE 6-bolt for regular duty PTO Right side (viewed from rear) All ranges—1.00 x turbine speed 200 lb ft (270 N•m) continuous 250 lb ft (340 N•m) intermittent
oil system	Oil type Capacity (excluding external circuit) Sump Filter Cooler*	Dexron® or Dexron II® 13 qt (12 litres) approx. Integral Integral, full-flow, replaceable element Remote mounted
size	Length Width Height Weight (dry)	27.22 in. (691 mm) (max) 20.72 in. (526 mm) 18.90 in. (480 mm) 275 lbs (125 kg) (approx)

*Not furnished on transmission assembly but is supplied by vehicle manufacturer.

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

design features



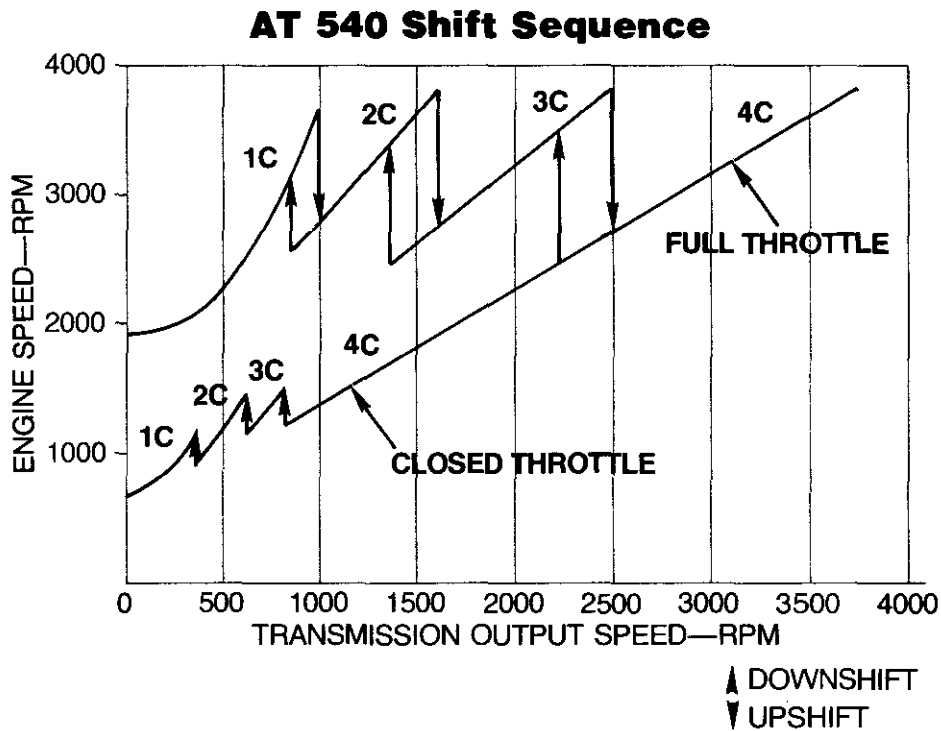
design features & benefits

- The AT540 has four forward gear ranges and one reverse. It can be used for virtually every vocation in trucks and buses up to 36,000 lbs. (16,329 kg) GVW and 50,000 lbs. (22,680 kg) GCW. The AT540 will accommodate gasoline or diesel engines up to 235 hp (175 kW). This automatic is especially suited to "stop and go" type of operation such as city delivery trucks, utility trucks, rental fleets and school buses. For use in some off-highway operations, a two-speed rear axle may be used with the AT540.
- The three-element torque converter provides smooth, shock-free operation. The truck-proven, spur-type planetary gearing, built for strength and long life, provides a good balance with most available axle ratios. The range clutches are disk-type, oil cooled, hydraulically-operated and self-compensating for normal wear.

design features & benefits (cont.)

- Fully automatic gear shifting in all forward ranges is performed by an internal output governor-controlled hydraulic servo system that is modulated by a vacuum modulator shift control with gasoline engines and by a mechanical shift modulation linkage with diesel engines.
- Built-in inhibitors prevent harmful downshifts or reverse shifts, unless the vehicle speed is within an acceptable range.
- The optional converter-driven power takeoff drive gear provides infinitely variable speed ratios in accordance with the power takeoff load. An external-mounted power takeoff can be operated when the vehicle is either moving or stopped.
- Automatic upshifting or downshifting within each drive range.
- One-piece aluminum die-cast housing.
- Provision for neutral start switch, reverse signal switch, SAE regular speedometer drive, and parking brake.

shifting flexibility and economy

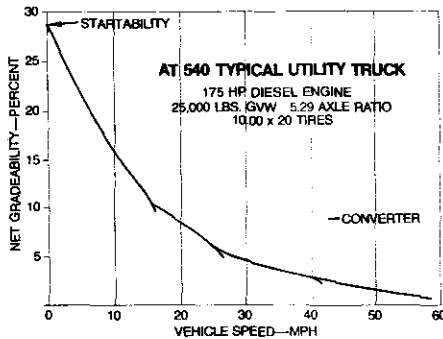


■ Fully Automatic, Governor—Controlled Shifting

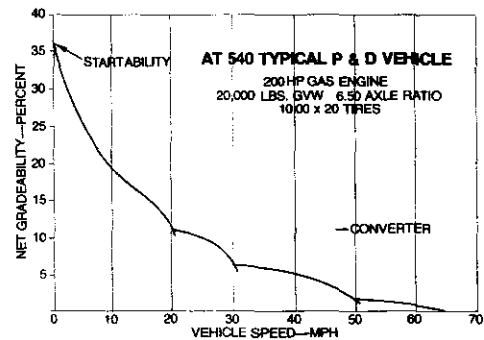
■ Converter Operation in All Ranges for Smooth Power Delivery

typical performance

Performance and Gradeability



- The torque converter provides "better than stick" startability for faster acceleration and easier pull out from ramps or ruts.
- Torque converter combined with constant mesh planetary gearing provides full power shifts and uninterrupted power flow for faster acceleration and shorter trip times.



applications

AT 540	AT 540
■ BEVERAGE DELIVERY	■ MUNICIPAL DUMP TRUCK
■ P & D TRUCK	■ UTILITY TRUCK
■ FIRE TRUCK	■ FARM TRUCK
■ LEASE/RENTAL	■ SCHOOL BUS

Warranty Coverage by Detroit Diesel Allison provides liberal protection for any factory production unit, without exception. Distributors are authorized to make immediate warranty corrections on applicable equipment. In an emergency, they are authorized to make on-site repairs.

WARRANTY LIMITATIONS AND ADJUSTMENTS SCHEDULE			
WARRANTY LIMITATIONS		ADJUSTMENT CHARGE TO BE PAID BY OWNER	
Months	Transmission Miles	Parts	Labor
0 - 24	0 - 50,000 50,001 - 100,000	No Charge No Charge	No Charge 50% of Service Outlets Normal Charge

PRep Specification Assistance. To be sure that you get the most efficient engine/transmission package for your operation, in your territory, with your preferred truck, your local Detroit Diesel Allison Distributor offers PRep.

PRep stands for "PRedicted equipment performance", and it helps to take the guesswork out of truck-buying decisions. What's more, it does it

almost instantaneously through the use of a computer connected to all Distributor outlets.

PRep 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.



Detroit Diesel Allison
Division of General Motors Corporation

Indianapolis, Indiana 46206

SA1254F

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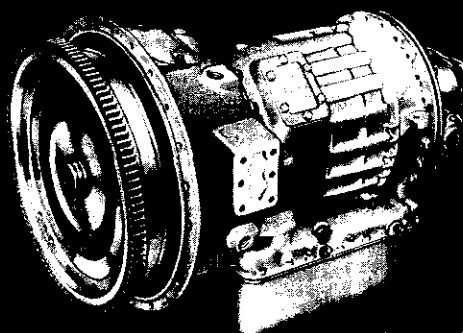
Allison Transmissions

automatic models

HT 740D/HT 740FS

up to 425 hp
(317 kW)

"FS" model
designed especially for
economical performance
with the Detroit Diesel
"FUEL SQUEEZER" engines



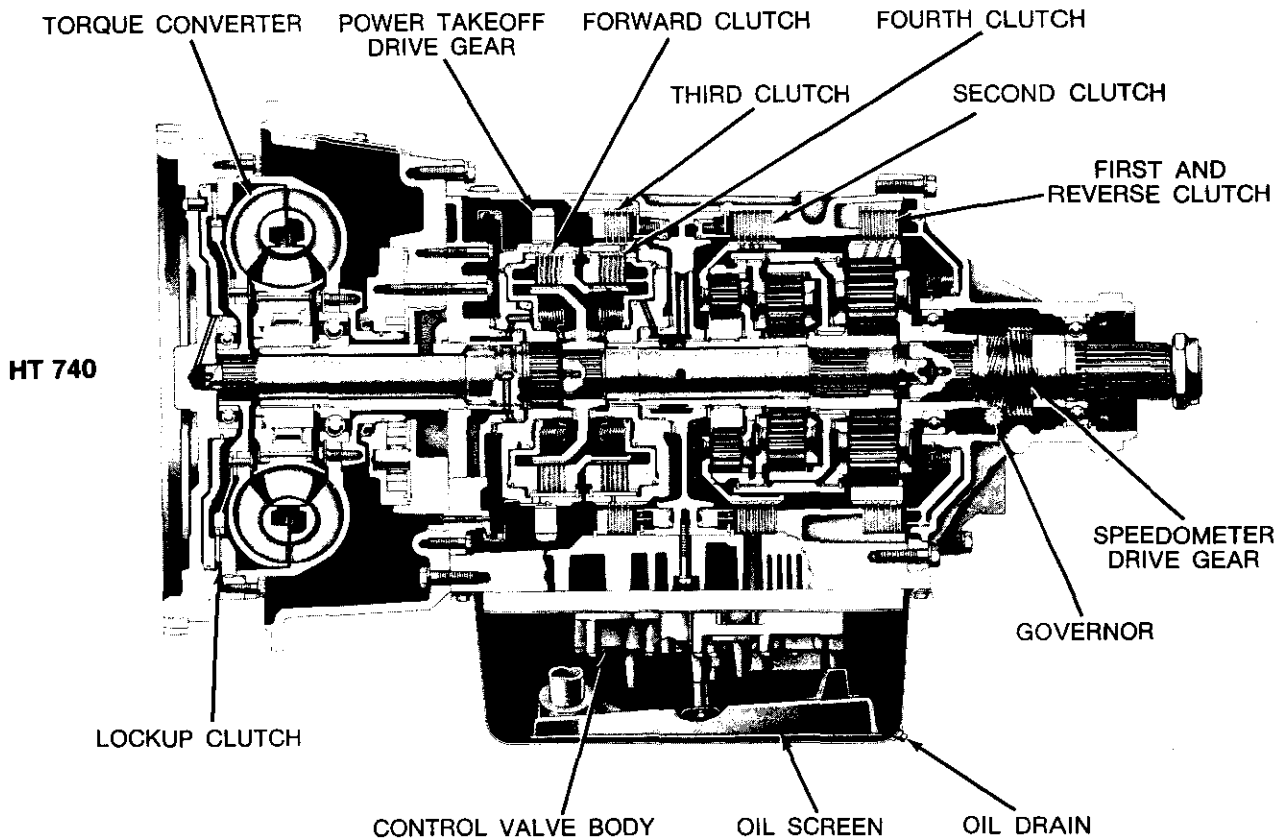
HT 740

specifications

rating	Input power (max)	425 net hp (317 kW)
	Input speed, full-load governed	2800 rpm (max) [1950 rpm (max) Fuel Squeezer], 1900 rpm (min)
	Input torque (max)	1300 lb ft (1762 N·m)
	Vehicle weight	Up to 80,000 lbs (36,280 kg) GVW and 130,000 lbs (58,960 kg) GCW
mounting	Direct	SAE 1 flywheel housing with flex disk drive
	Remote	One 6-hole SAE mounting pad each side of converter housing with tail support
torque converter	Type	Single-stage, 3-element, polyphase
	Stall torque ratios	TC 470—3.04 TC 495—2.21 TC 499—2.09
	Lockup clutch	Effective in all forward ranges or effective in 2nd through 4th ranges—depending on model used
hydraulic retarder (optional)	Type	Coupling type rotor between fixed stators
	Capacity (horsepower absorption)	365 hp (272 kW) @ 2100 rpm (rotor speed)
gearing	Type	Constant mesh, spur type, planetary
	Gear ratios	
	First	3.692
	Second	2.021
	Third	1.383
	Fourth	1.000
power takeoff*	Reverse	6.035
	Converter driven (one)	
	Location	Top, left side—10 o'clock position (as viewed from rear)
	Size of opening	SAE 6-bolt
	Ratio	1.00 x turbine speed
	Drive gear rating	Intermittent—400 lb ft (543 N·m) Continuous—300 lb ft (407 N·m)
	Engine driven (two) (optional)	
	Location	Converter housing: one at 1 o'clock position and one at 8 o'clock position (as viewed from rear)
	Size of opening	SAE 8-bolt
	Ratio	1 o'clock—1.35 x engine speed 8 o'clock—0.84 x engine speed
oil system	Rating	Intermittent—260 hp (194 kW) Continuous—200 hp (149 kW)
	Oil type	Dexron II® or type C-3
	Capacity	7.5 US gal (28.4 litres)
	Sump	Integral
size	Filter*	External, remote mounted
	Length	37.4 in. (950 mm)
	Width	22.5 in. (572 mm)
	Height	25.6 in. (650 mm)
	Weight (dry)	870 lbs (395 kg) (approx.)

*Not furnished on transmission assembly but is supplied by vehicle manufacturer.
Note: All data and specifications subject to change without notice.

design features



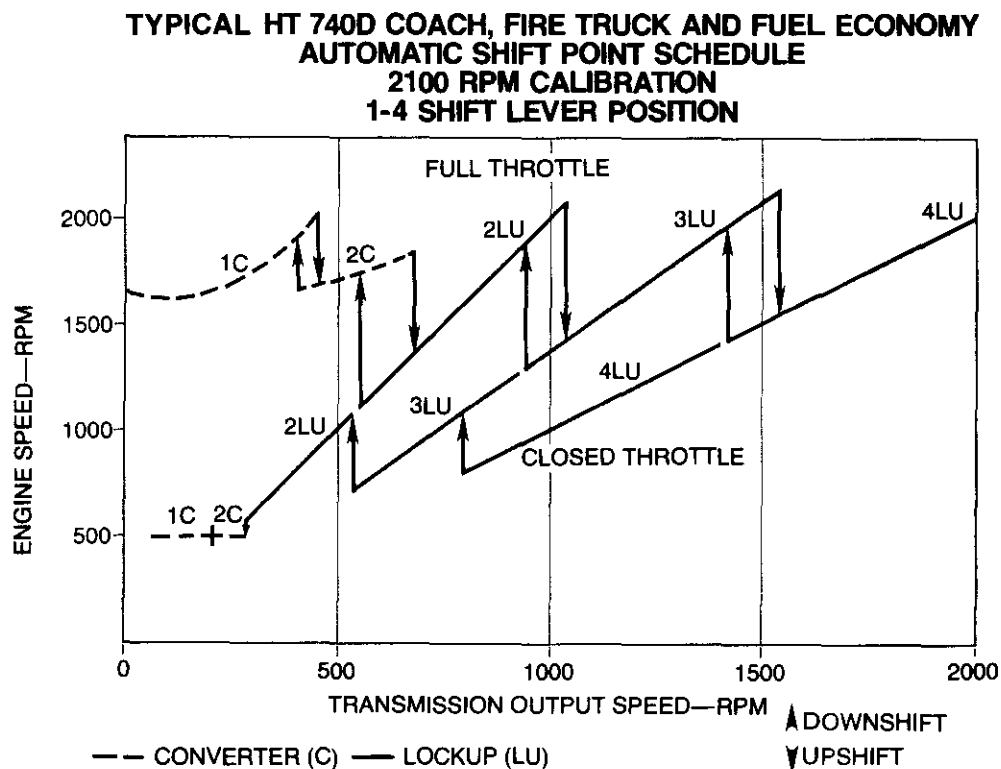
design features & benefits

- The HT 740 has four forward gear ranges and one reverse, and will accommodate diesel engines up to 425 net hp (317 kW). It is designed for use in medium- and heavy-duty trucks and buses up to 80,000 lbs (36,280 kg) GVW and 130,000 lbs (58,960 kg) GCW.
- Automatic upshifting and downshifting in each drive range.
- Hydraulic retarder with modulation (optional).
- Shift modulation with throttle.
- HT 740FS model specifically designed for Detroit Diesel "Fuel Squeezers".

design features & benefits (cont.)

- Inhibitors to prevent harmful downshifts or reverse shifts.
- Engine-driven power takeoff drive gear (optional).
- Converter-driven power takeoff drive gear.
- Choice of converters to match wide range of diesel engines.
- Provision for neutral start switch, reverse signal switch, SAE heavy-duty speedometer drive, and drum-type parking brake.
- Multidisk, self-adjusting hydraulic clutches.

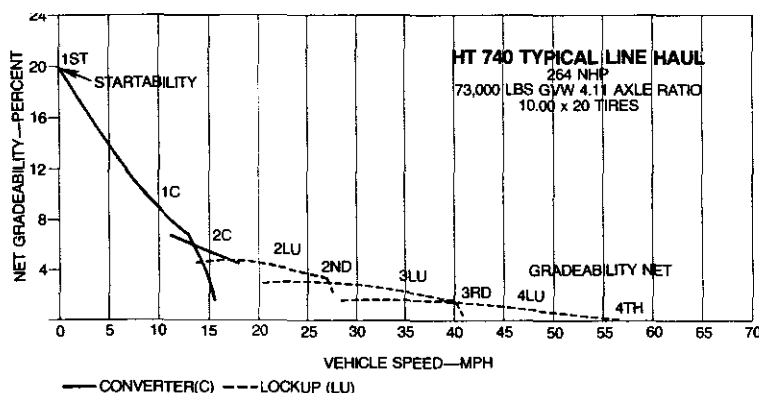
shifting flexibility and economy



- Fully automatic, governor-controlled shifting

- Lockup clutch effective in all forward ranges or effective in 2nd through 4th ranges—depending on model used

typical performance



Performance and Gradeability

- The torque converter provides "better than stick" startability for faster acceleration and easier pull out from ramps or ruts.
- Torque converter combined with constant mesh planetary gearing provides full power shifts and uninterrupted power flow for faster acceleration and shorter trip times.
- Automatic lockup clutch operation after start provides maximum performance and fuel economy.

applications

HT 740			
	SHORT HAUL TRACTOR		BULK HAULING
	BUS		DUMP TRUCK (w/auxiliary)
	FIRE TRUCK		TRANSIT MIXER (w/auxiliary)
	LINE-HAUL		LOGGING TRUCK (w/auxiliary)

Warranty Coverage by Detroit Diesel Allison provides liberal protection for any factory production unit, without exception. Distributors are authorized to make immediate warranty corrections on applicable equipment. In an emergency, they are authorized to make on-site repairs.

WARRANTY LIMITATIONS AND ADJUSTMENTS SCHEDULE			
WARRANTY LIMITATIONS		ADJUSTMENT CHARGE TO BE PAID BY OWNER	
Months	Transmission Miles	Parts	Labor
HT 740D 0-24	0 - 50,000	No Charge	No Charge
	50,001 - 100,000	No Charge	50% of Service Outlets Normal Charge
HT 740FS 0-24	200,000	No Charge	No Charge

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almost instantaneously through the use of a computer connected to all Distributor outlets.

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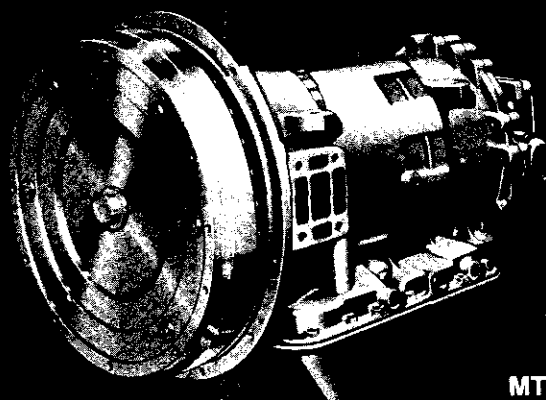
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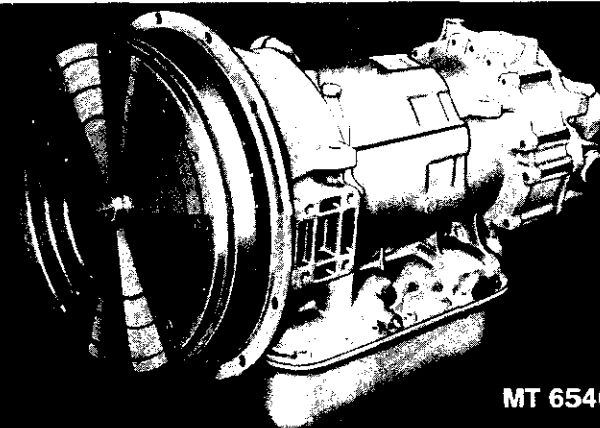
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Allison Transmissions automatic models

MT 644	MT 654CR
up to 300 hp (225 kW)	up to 300 hp (225 kW)



MT 644



MT 654CR

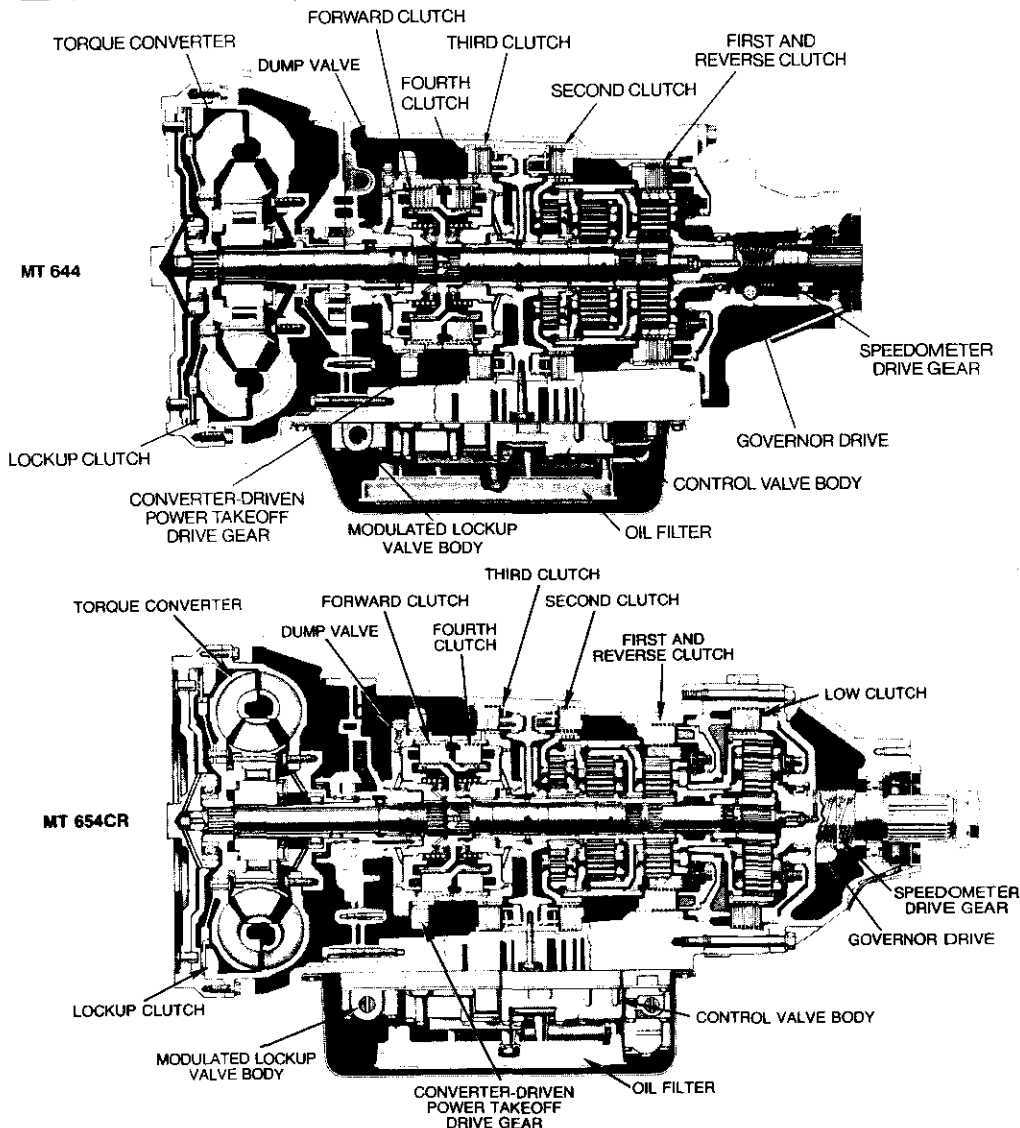
specifications

		MT 644	MT 654CR
rating	Net input power	300 hp (225 kW) (max)	300 hp (225 kW) (max)
	Input speed, full-load governed	3000 rpm (max) 2000 rpm (min)	3000 rpm (max) 1900 rpm (min)
	Net input torque	780 lb ft (1060 N·m) (max)	780 lb ft (1060 N·m) (max)
	Vehicle weight (GVW or GCW)	Up to 50,000 lbs (22,680 kg)	Up to 80,000 lbs (36,300 kg)
mounting	Engine	SAE 1 or 2 flywheel housing with flex disk drive One 4-hole, SAE mounting pad each side of converter housing; two holes on top at rear of transmission	
	Vehicle		
torque converter	Type	Single-stage, 3-element, multiphase	Single-stage, 3-element multiphase
	Stall torque ratio	TC 494-1.9 TC 495-2.2	TC 495-2.2 TC 497-2.7
	Lockup clutch, automatic, modulated	Effective in 2nd, 3rd, & 4th	Effective in 2nd, 3rd, 4th and 5th
gearing	Type	Constant mesh, spur type planetary	Constant mesh, spur type planetary
	Gear ratios:		
	First	3.58	4.17
	Second	2.09	2.21
	Third	1.39	1.66
	Fourth	1.00	1.27
	Fifth	—	1.00
	Reverse	5.67	10.76
power takeoff	Type	Converter driven	
	Size of opening	SAE 6-bolt	
	Location	Right side (viewed from rear)	
	Drive gear ratio	All ranges—1.00 x converter output speed	
	Drive gear rating	300 lb ft (407 N·m) throughout speed range	
oil system	Oil type	Dexron®, Dexron II®	
	Capacity (excluding external circuit)	15 qt. (14 litres)	
	Sump	Integral	
	Filter or screen	Integral	
	Cooler*	Remote mounted	
size	Length	30.42 in (773 mm) (max)	36.23 in (920 mm) (max)
	Width	19.25 in (489 mm)	19.25 in (489 mm)
	Height	21.60 in (549 mm)	21.60 in (549 mm)
	Weight (dry)	565 lbs (255 kg)	625 lbs (285 kg)

*Not furnished on transmission assembly but is supplied by vehicle manufacturer.

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

design features



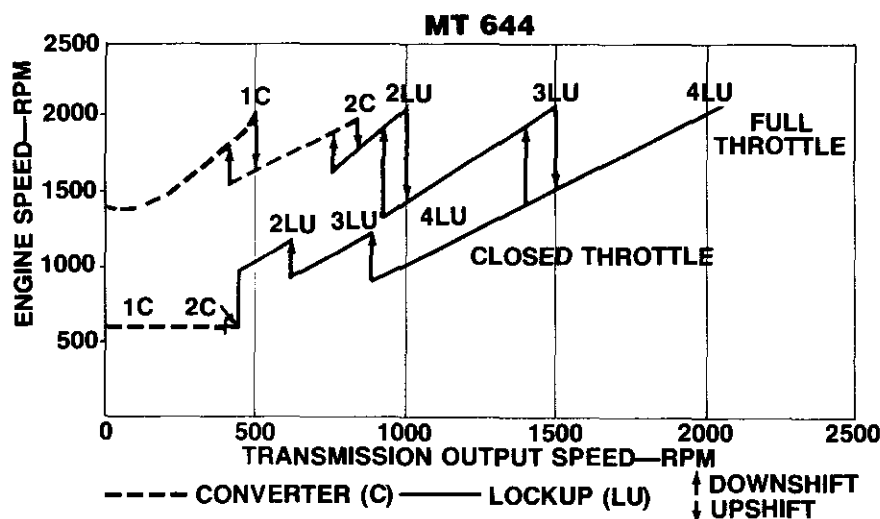
design features & benefits

- The MT 644 has four forward gear ranges and one reverse. It is designed for high power-to-weight ratio vehicles (buses, fire trucks, etc.) using conventional torque engines or for truck, bus, and tractor applications using constant horsepower/high torque rise engines; the MT 644 will accommodate engines up to 300 HP (224 kW) and vehicles up to 50,000 lbs. (22,680 kg) GVW or GCW.
- The MT 654CR has five forward gear ranges and one reverse. It is designed for trucks, buses, and tractors up to 80,000 lbs. (36,300 kg) GVW or GCW and will accommodate diesel engines up to 300 HP (224 kW).
- Automatic upshifting or downshifting within each drive range. There is a choice of drive ranges to meet traffic or road conditions.
- The automatic shifts are throttle modulated to permit minimum engine speed to meet the load and traffic demands.
- Provision for variety of flanges and parking brakes (vehicle manufacturer furnishing) to fit various applications; also provision for: neutral start-switch, reverse signal switch, and SAE regular speedometer drive.

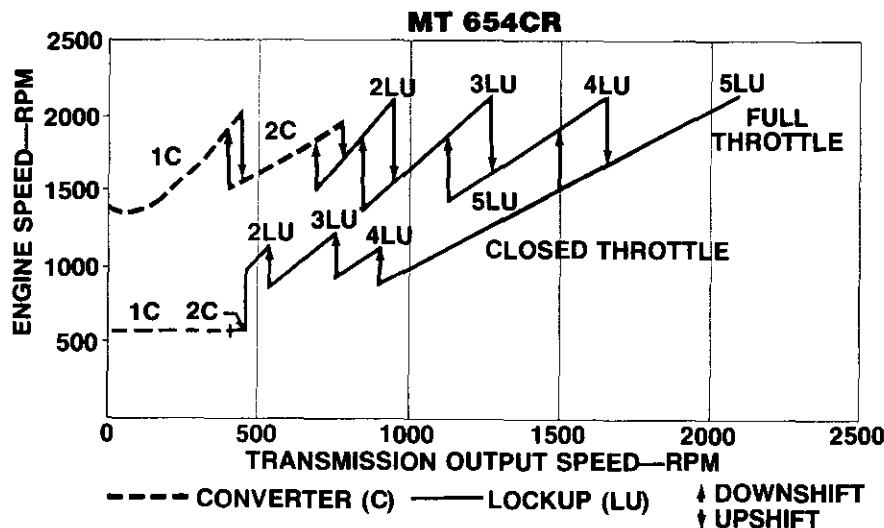
design features & benefits (cont.)

- Automatic lockup clutch, throttle modulated for improved vehicle braking.
- Multidisc, self-adjusting, hydraulic clutches. The range clutches are disc type, oil cooled, hydraulic-operated and self compensating for normal wear.
- The truck proven, spur type planetary gearing is counterphased, providing both max strength and quietness.
- Inhibitors are built-in which prevent downshifts or shifts to reverse, unless the vehicle speed is within an acceptable range.
- Converter-driven power takeoff drive gear (for side mounted PTO). The power takeoff opening located on the right side of the transmission (viewed from the rear), provides infinitely variable speed ratios to meet with the power takeoff load. It has the capability of satisfying virtually all auxiliary drive, side-mount power takeoff requirements.

shifting flexibility and economy

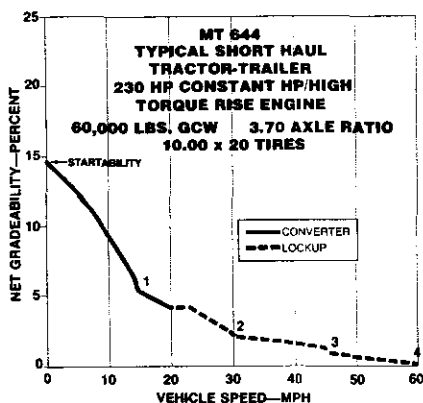


- Fully Automatic Operation
- Converter Operation in 1st and 2nd for Fast, Smooth Starts
- Lock-up Continuous from 2nd through Top Gear for Maximum Fuel Economy
- Modulated Lock-up for Improved Vehicle Braking



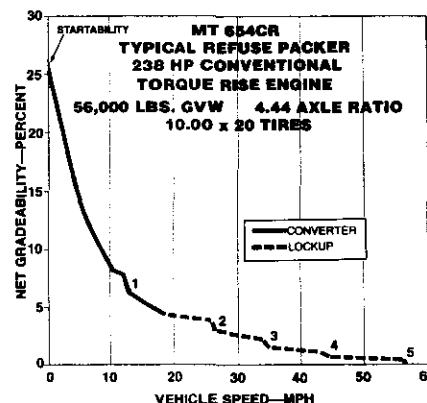
- Fully Automatic Operation
- Converter Operation in 1st and 2nd for Fast, Smooth Starts
- Lock-up Continuous from 2nd through Top Gear for Maximum Fuel Economy
- Modulated Lock-up for Improved Vehicle Braking

typical performance



Performance and Gradeability

- The torque converter provides "better than stick" startability for faster acceleration and easier pull out from ramps or ruts.
- Torque converter combined with constant mesh planetary gearing provides full power shifts and uninterrupted power flow for faster acceleration and shorter trip times.
- Automatic lock-up clutch operation after start provides maximum performance and fuel economy.



applications

MT 644	MT 654CR
■ SHORT HAUL TRACTOR	■ DUMP TRUCK
■ P & D TRUCK	■ REFUSE TRUCK
■ FIRE TRUCK	■ SHORT HAUL TRACTOR
■ BUS	■ BUS

Warranty Coverage by Detroit Diesel Allison provides liberal protection for any factory production unit, without exception. Distributors are authorized to make immediate warranty corrections on applicable equipment. In an emergency, they are authorized to make on-site repairs.

WARRANTY LIMITATIONS AND ADJUSTMENTS SCHEDULE			
WARRANTY LIMITATIONS		ADJUSTMENT CHARGE TO BE PAID BY OWNER	
Months	Transmission Miles	Parts	Labor
0 - 24	Unlimited	No Charge	No Charge

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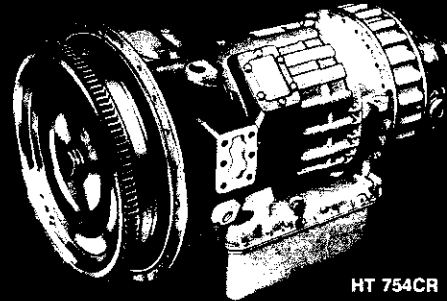
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Allison Transmissions

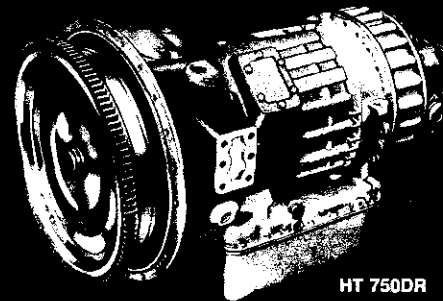
automatic models

HT 754CR, HT 750DR, HT 750DR(DB)

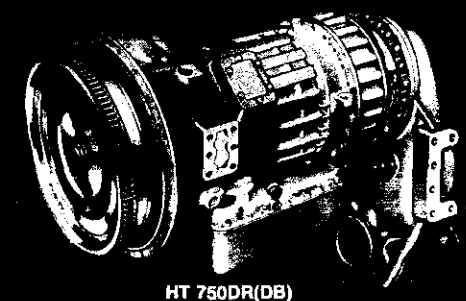
up to 425 hp
(317 kW)



HT 754CR



HT 750DR



HT 750DR(DB)

specifications

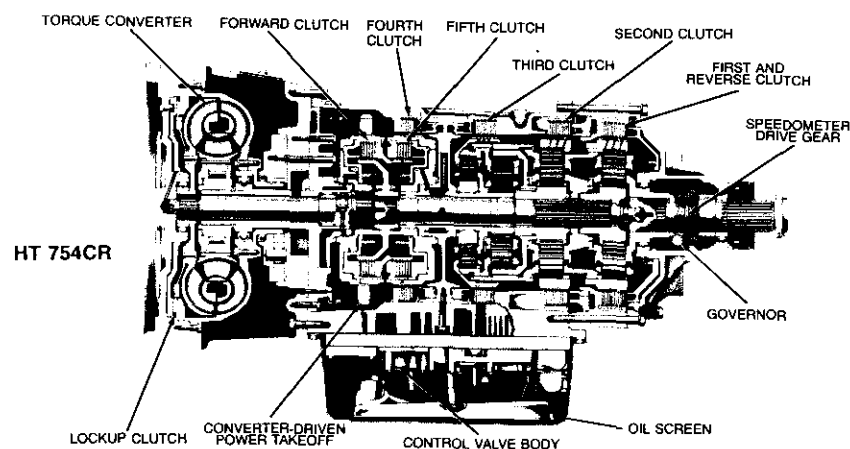
		HT 754CR	HT 750DR	HT 750DR(DB)
rating	Input power (max)	425 net hp (317 kW)	425 net hp (317 kW)	425 net hp (317 kW)
	Input speed	2100 rpm (max); 1900 rpm (min)	2800 rpm (max); 1900 rpm (min)	2500 rpm (max); 1900 rpm (min)
	Input torque (max)	1300 lb ft (1762 N-m)	1300 lb ft (1762 N-m)	1300 lb ft (1762 N-m)
	Vehicle weight	Up to 80,000 lbs (36,280 kg) GVW and 130,000 lbs (58,960 kg) GCW		
mounting	Direct	SAE 1 flywheel housing with flex disk drive		Direct
	Remote	One 6-hole SAE mounting pad each side of converter housing with tail support		Remote
torque converter	Type	Single-stage, 3-element, polyphase	Single-stage, 3-element, polyphase	Single-stage, 3-element, polyphase
	Stall torque ratios	TC 470—3.04 TC 495—2.21 TC 499—2.09	TC 470—3.04 TC 495—2.21 TC 499—2.09	TC 470—3.04 TC 495—2.21 TC 499—2.09
	Lockup clutch	Effective in all forward ranges	Effective in all forward ranges	Effective in all forward ranges
	Hydraulic retarder (optional)	Coupling type rotor between fixed stators 365 hp (272 kW) @2100 rpm (rotor speed)		
gearing	Type	Constant mesh, spur type planetary	Constant mesh, spur type planetary	Constant mesh, spur type planetary
	Gear range			
	First	3.692	7.973	7.973
	Second	2.002	3.188	3.188
	Third	1.583	2.021	2.021
	Fourth	1.253	1.383	1.383
	Fifth	1.000	1.000	1.000
	Reverse	9.648	4.716	4.716
power takeoff*	Converter driven (one)	Top, left side at 10 o'clock position (as viewed from rear)		
	Location	SAE 6-bolt		
	Size of opening	1.00 x turbine speed (all ranges)		
	Ratio	Intermittent—400 lb ft (543 N-m)		
power takeoff*	Engine driven (two) (optional)	One on top of converter housing at one o'clock position;		
	Location	One on left side of converter housing at 8 o'clock position (as viewed from rear)		
	Size of opening	SAE 8-bolt		
	Ratio	Top—1.35 x engine speed—Side—.844 x engine speed		
oil system	Oil type	Dexron II® or type C-3		
	Capacity (less external lines)	7.5 US gal (28.4 litres)		
	Sump	Integral		
	Filter*	External. Remote mounted		
drop box	Capacity			2.67 U.S. Qts. (2.5 litres)
	Oil type			30 Weight, C-3
drop box disconnects (optional)				Disconnects are available at all three locations: B, C and D
size	Length	41.0 in (1041 mm)	41.0 in (1041 mm)	49.0 in (1245 mm)
	Width	22.5 in (572 mm)	22.5 in (572 mm)	22.5 in (572 mm)
	Height	25.6 in (650 mm)	25.6 in (650 mm)	37.7 in (958 mm)
	Weight (dry)	980 lbs (445 kg) (approx)	990 lbs (450 kg) (approx)	1540 lbs (700 kg) (approx)

*Not furnished on transmission assembly but is supplied by vehicle manufacturer.

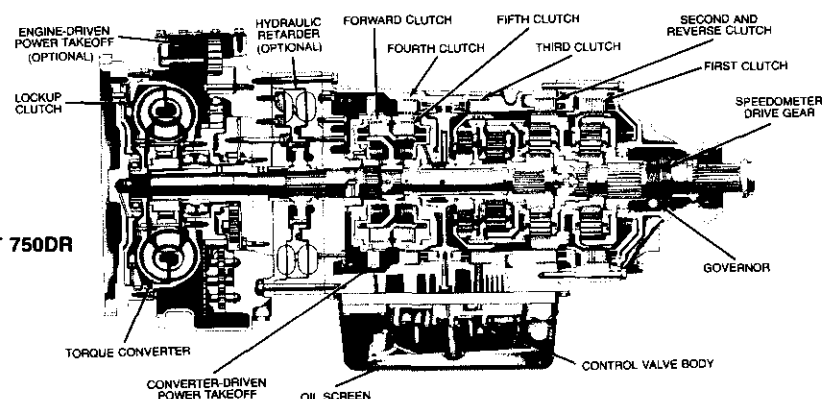
Note: All data and specifications subject to change without notice.

†Based on weight on drive axle and use of disconnects.

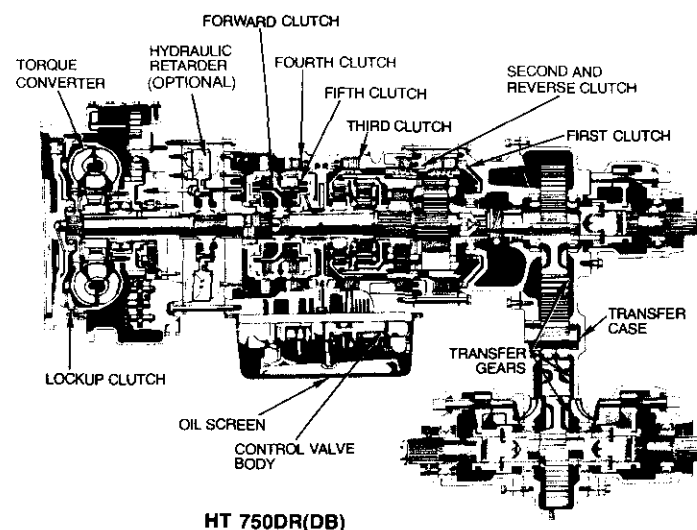
design features



HT 754CR



HT 750DR



HT 750DR(DB)

design features & benefits

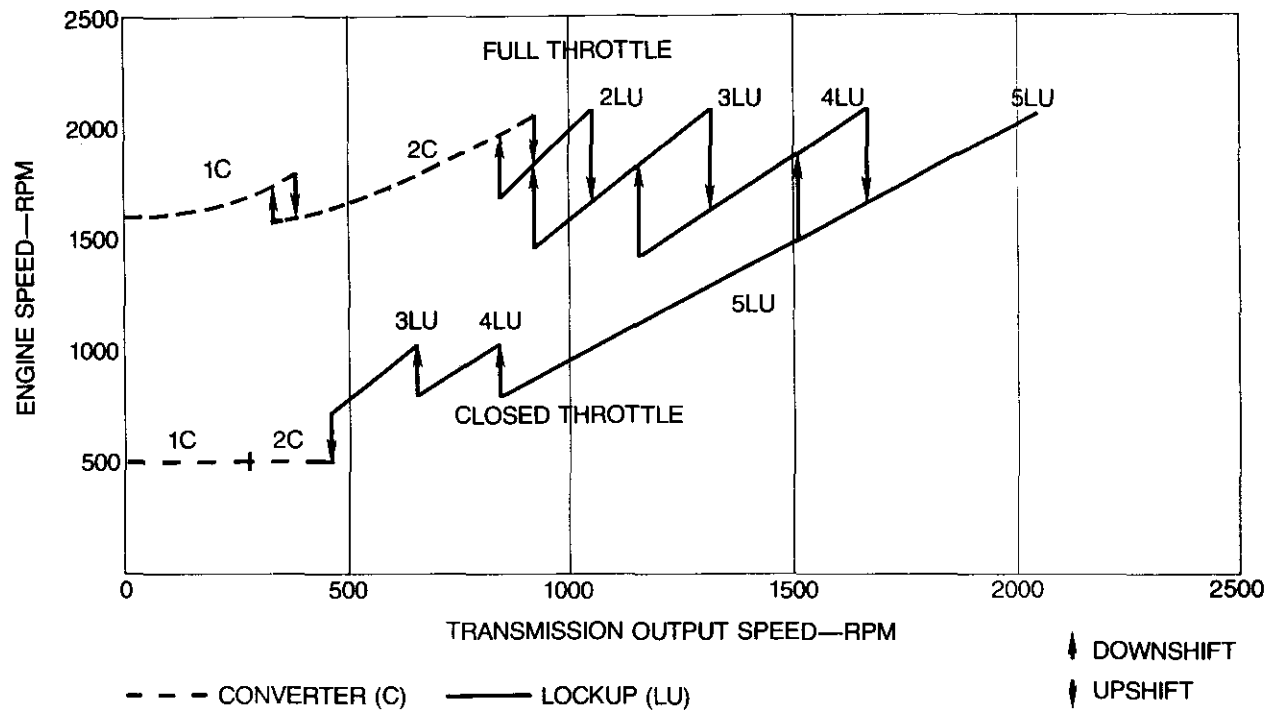
- The Allison Automatic HT 750 series transmission is designed for use in medium- and heavy-duty trucks up to 80,000 pounds (36,280 kg) GVW and 130,000 pounds (58,960 kg) GCW.
- For diesel engines up to 425 net hp (317 kW).
- Five forward gear ranges, one reverse.
- Automatic upshifting and downshifting in all drive ranges on HT 754CR; in upper four ranges on HT 750DR.

- Hydraulic retarder (optional).
- Multidisk, self-adjusting hydraulic clutches.
- Converter-driven power takeoff drive gear.
- Engine-driven power takeoff (optional).
- Inhibitors to prevent harmful downshifts or reverse shifts.
- Choice of converters to match wide range of diesel engines.

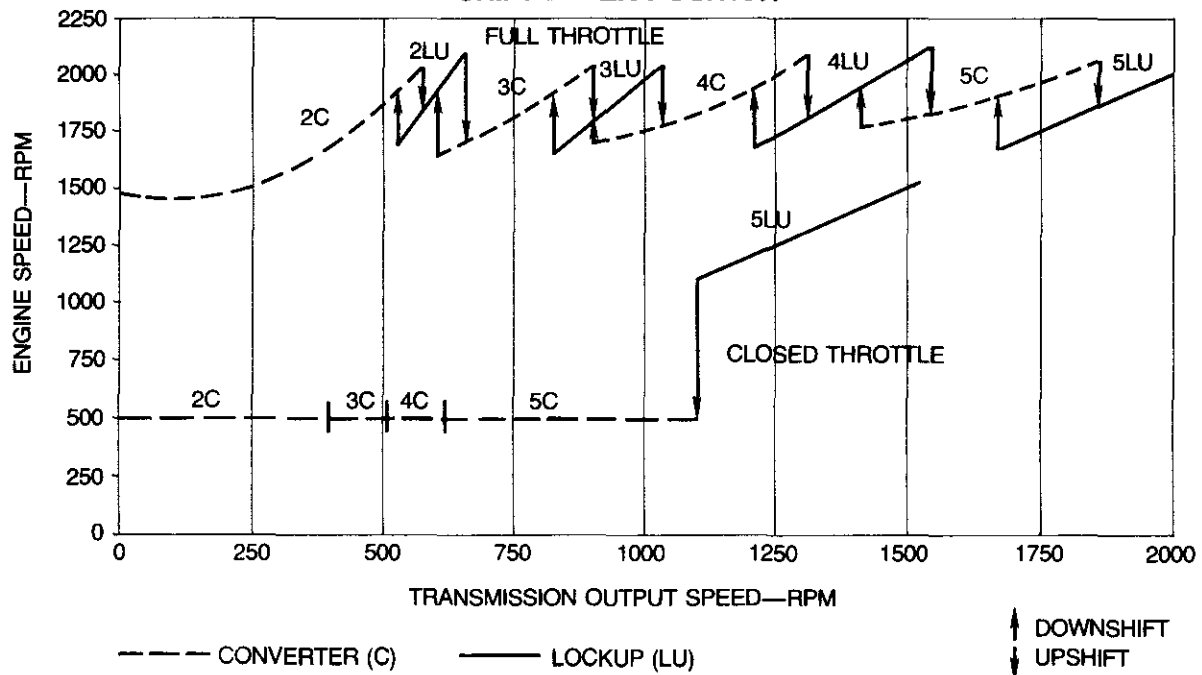
- Provision for neutral start switch, reverse signal switch, SAE heavy-duty speedometer drive, and drum-type parking brake.
- Mechanical shift modulation.
- Optional drop box configuration.
- Five optional transfer gear housing positions available on drop box model.
- Output disconnects available in three locations on the dropbox model (flange positions B, C, and D).

shifting flexibility and economy

HT 754CR SHIFT SEQUENCE



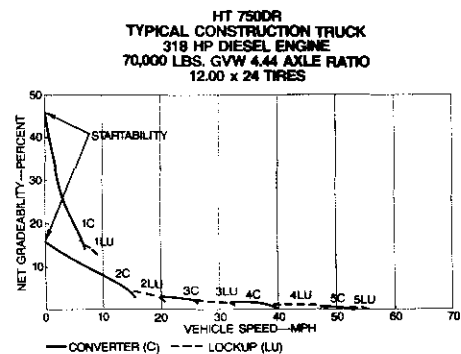
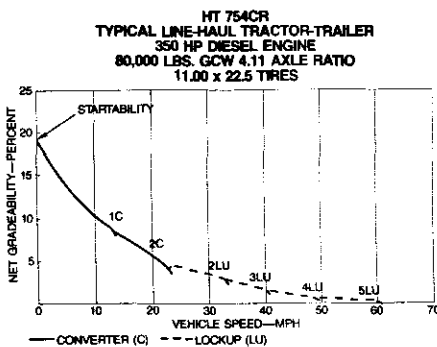
TYPICAL HT 750DR GENERAL AUTOMATIC SHIFT POINT SCHEDULE 2100 RPM CALIBRATION 2-5 SHIFT LEVER POSITION











typical performance

Performance and Gradeability

- The torque converter provides "better than stick" startability for faster acceleration and easier pull out from ramps or ruts.
- Torque converter combined with constant mesh planetary gearing provides full power shifts and uninterrupted power flow for faster acceleration and shorter trip times.
- Automatic lockup clutch operation after start provides maximum performance and fuel economy.



applications

HT 754CR	HT 750DR
 ■ LINE-HAUL	 ■ DUMP TRUCKS
 ■ BULK HAULING	 ■ LOW BOY TRUCK
 ■ LOGGING TRUCK	 ■ TRANSIT MIXER
 ■ CONSTRUCTION TRUCK	 ■ LOGGING TRUCK

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WARRANTY LIMITATIONS AND ADJUSTMENTS SCHEDULE			
WARRANTY LIMITATIONS		ADJUSTMENT CHARGE TO BE PAID BY OWNER	
Months	Transmission Miles	Parts	Labor
0 - 24	0 - 50,000 50,001 - 100,000	No Charge No Charge	No Charge 50% of Service Outlets Normal Charge

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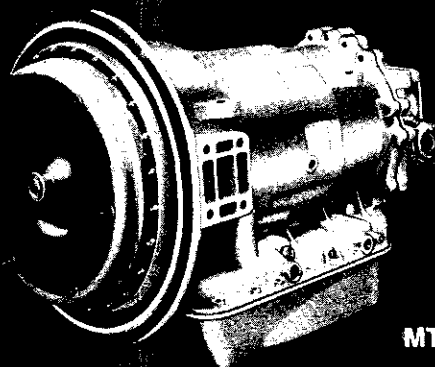
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Allison Transmissions

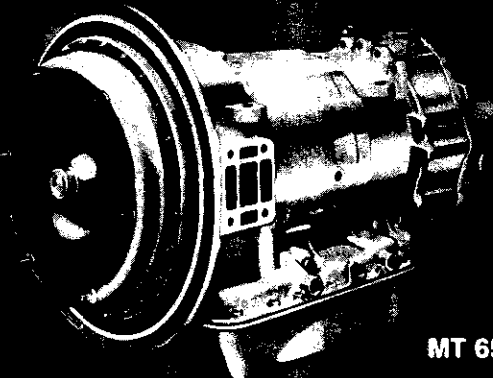
automatic models

MT 643, MT 653DR

up to 250 hp
(186 kW)



MT 643



MT 653DR

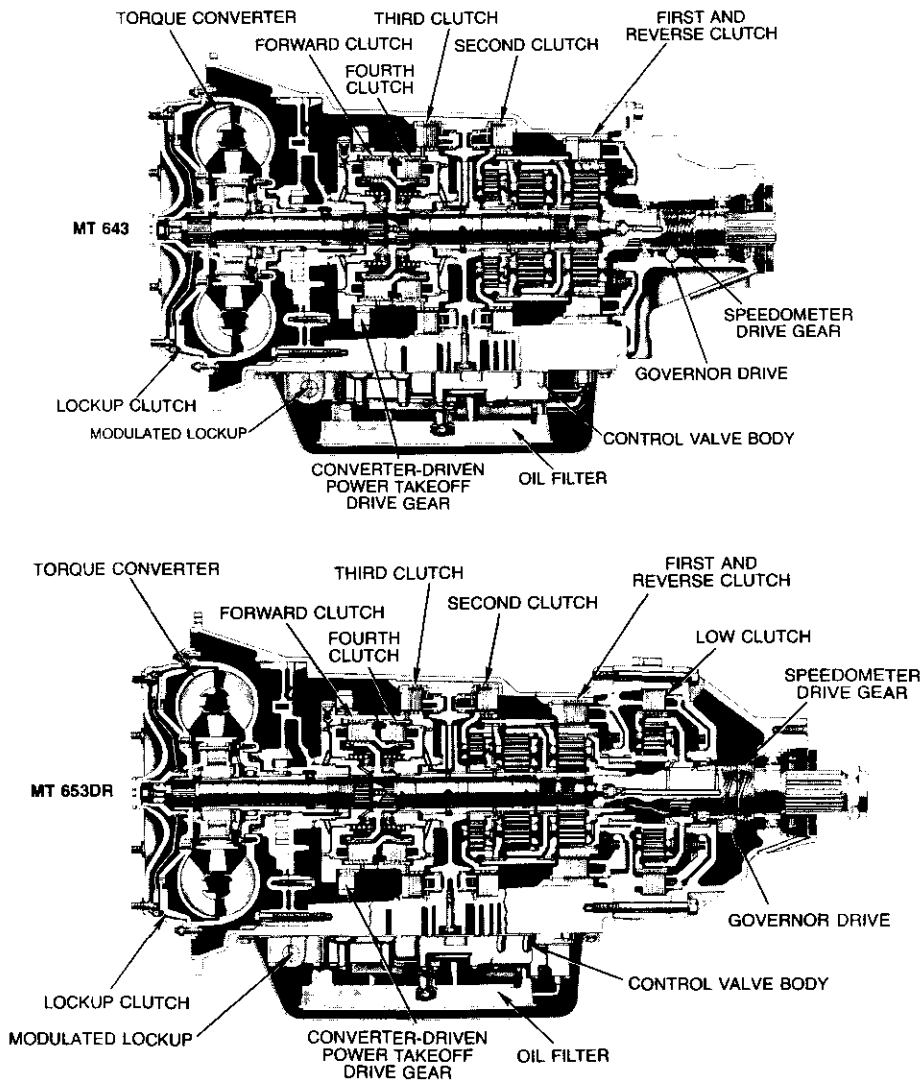
specifications

		MT 643	MT 653DR
rating	Net input power	250 hp (186 kW) (max)	250 hp (186 kW) (max)
	Input speed, full-load governed	4000 rpm (max) 2200 rpm (min)	4000 rpm (max) 2200 rpm (min)
	Net input torque	585 lb ft (793 N·m) (max)	585 lb ft (793 N·m) (max)
	Vehicle Weight (GVW or GCW)	Up to 73,280 lbs (33,240 kg)	Up to 73,280 lbs (33,240 kg)
mounting	Engine	SAE 2 flywheel housing with flex disk drive One 4-hole, SAE mounting pad each side of converter housing; two holes on top at rear of transmission	
	Vehicle		
torque converter	Type	Single-stage, 3-element multiphase	single-stage, 3-element multiphase
	Stall torque ratio	TC 350-3.1 TC 370-2.4 TC 380-1.8	TC 350-3.1 TC 370-2.4 TC 380-1.8
	Lockup clutch, automatic	Effective in 3rd & 4th	Effective in 4th & 5th
	Modulated Lockup	Effective in 2nd, 3rd & 4th	Effective in 3rd, 4th & 5th
gearing	Type	Constant mesh, spur type planetary	Constant mesh, spur type planetary
	Gear ratios:		
	First	3.58	8.04
	Second	2.09	3.58
	Third	1.39	2.09
	Fourth	1.00	1.39
	Fifth	—	1.00
	Reverse	5.67	5.67
power takeoff	Type	Converter driven	
	Size of opening	SAE 6-bolt	
	Location	Right side (viewed from rear)	
	Drive gear ratio	All ranges—1.00 x converter output speed	
oil system	Drive gear rating	300 lb ft (407 N·m) throughout speed range	
	Oil Type		Dexron® or Dexron II®
	Capacity (excluding external circuit)		16 qt. (15 litres)
	Sump		Integral
	Filter or screen		Integral
size	Cooler*		Remote mounted
	Length	30.70 in (780 mm) (max)	36.23 in (920 mm) (max)
	Width	19.25 in (489 mm)	19.25 in (489 mm)
	Height	21.60 in (549 mm)	21.60 in (549 mm)
	Weight (dry)	510 lbs (231 kg)	540 lbs (245 kg)

*Not furnished on transmission assembly but is supplied by vehicle manufacturer.

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

design features



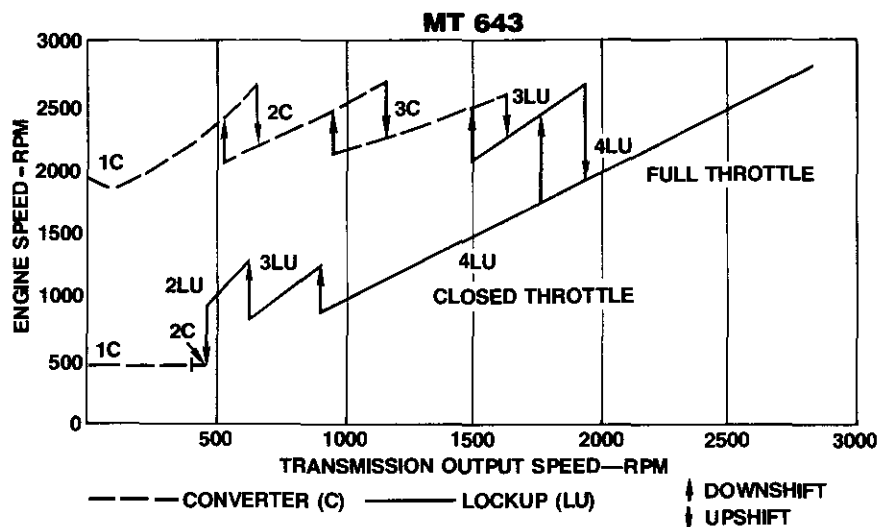
design features & benefits

- For large bore gasoline and mid-range diesel engines.
- Four forward gear ranges, one reverse (MT 643). Five forward gear ranges, one reverse (MT 653DR).
- Automatic upshifting or downshifting within each drive range.
- Automatic lockup clutch, throttle modulated for improved vehicle braking.
- Multidisk, self-adjusting, hydraulic clutches.
- Inhibitors to prevent harmful downshifts or reverse shifts.
- The output shaft splines are rolled not cut thus reducing stress and providing maximum strength.

design features & benefits (cont.)

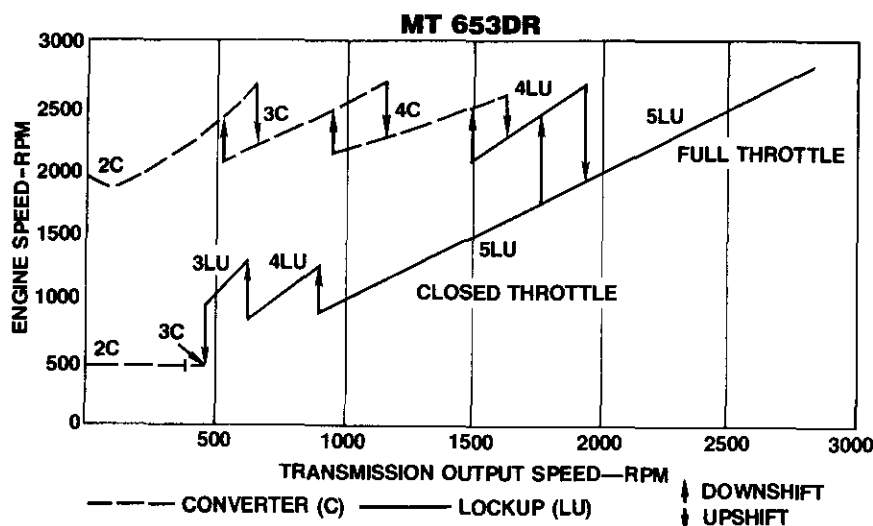
- The concentricity and surface finish to the governor gear and governed drive gear, provides for longer wear.
- Conically shaped rear cover reduces driveline induced damage to transmission.
- New filter to protect the governor from contaminants.
- Forward clutch dump valves to prevent overspeeding of transmission and engine.
- Clutch control provides for faster application of the clutch in reverse.
- Main pressure increased to improve shift quality.
- Truck-proven, spur-type planetary gearing.
- Vacuum shift modulation (gasoline engines); mechanical shift modulation (gasoline and diesel engines).
- Converter-driven power takeoff drive gear (for side mounted PTO).

shifting flexibility and economy



MT 643 Shift Sequence

- Fully Automatic Operation
- Converter Operation in 1st through 3rd for Fast, Smooth Starts
- Lock-up in the 3rd and 4th gear for Maximum Fuel Economy
- Modulated Lockup for Improved Vehicle Braking

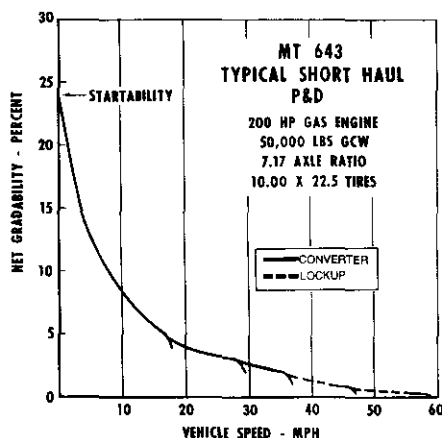


MT 653DR Shift Sequence

(This graph shows the Shift Sequence of the MT 653 in the 2-5 position.)

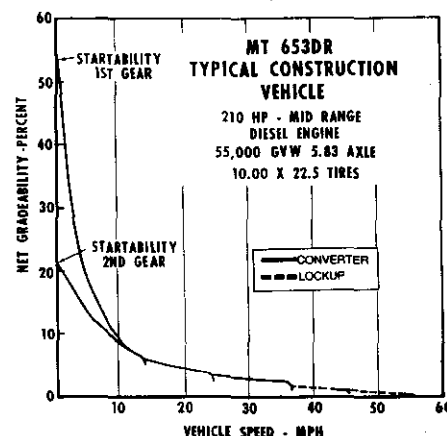
- Fully Automatic Operation
- Converter Operation in 2nd through 4th for Fast, Smooth Starts
- Lock-up in 4th and 5th for Top Fuel Economy
- Modulated Lockup for Improved Vehicle Braking

typical performance



Performance and Gradeability

- The torque converter provides "better than stick" startability for faster acceleration and easier pull out from ramps or ruts.
- Torque converter combined with constant mesh planetary gearing provides full power shifts and uninterrupted power flow for faster acceleration and shorter trip times.
- Automatic lock-up clutch operation after start provides maximum performance and fuel economy.



applications

MT 643	MT 653DR
■ SHORT HAUL TRACTOR	■ DUMP TRUCK
■ P & D TRUCK	■ REFUSE TRUCK
■ FIRE TRUCK	■ TRANSIT MIXER
■ BUS	■ BLOCK TRUCK

Warranty Coverage by Detroit Diesel Allison provides liberal protection for any factory production unit, without exception. Distributors are authorized to make immediate warranty corrections on applicable equipment. In an emergency, they are authorized to make on-site repairs.

WARRANTY LIMITATIONS AND ADJUSTMENTS SCHEDULE			
WARRANTY LIMITATIONS		ADJUSTMENT CHARGE TO BE PAID BY OWNER	
Months	Transmission Miles	Parts	Labor
0 - 24	0 - 50,000 50,001 - 100,000	No Charge No Charge	No Charge 50% of Service Outlets Normal Charge

PRep Specification Assistance. To be sure that you get the most efficient engine/transmission package for your operation, in your territory, with your preferred truck, your local Detroit Diesel Allison Distributor offers PRep.

PRep stands for "PRedicted equipment performance", and it helps to take the guesswork out of truck-buying decisions. What's more, it does it

almost instantaneously through the use of a computer connected to all Distributor outlets.

PRep 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.



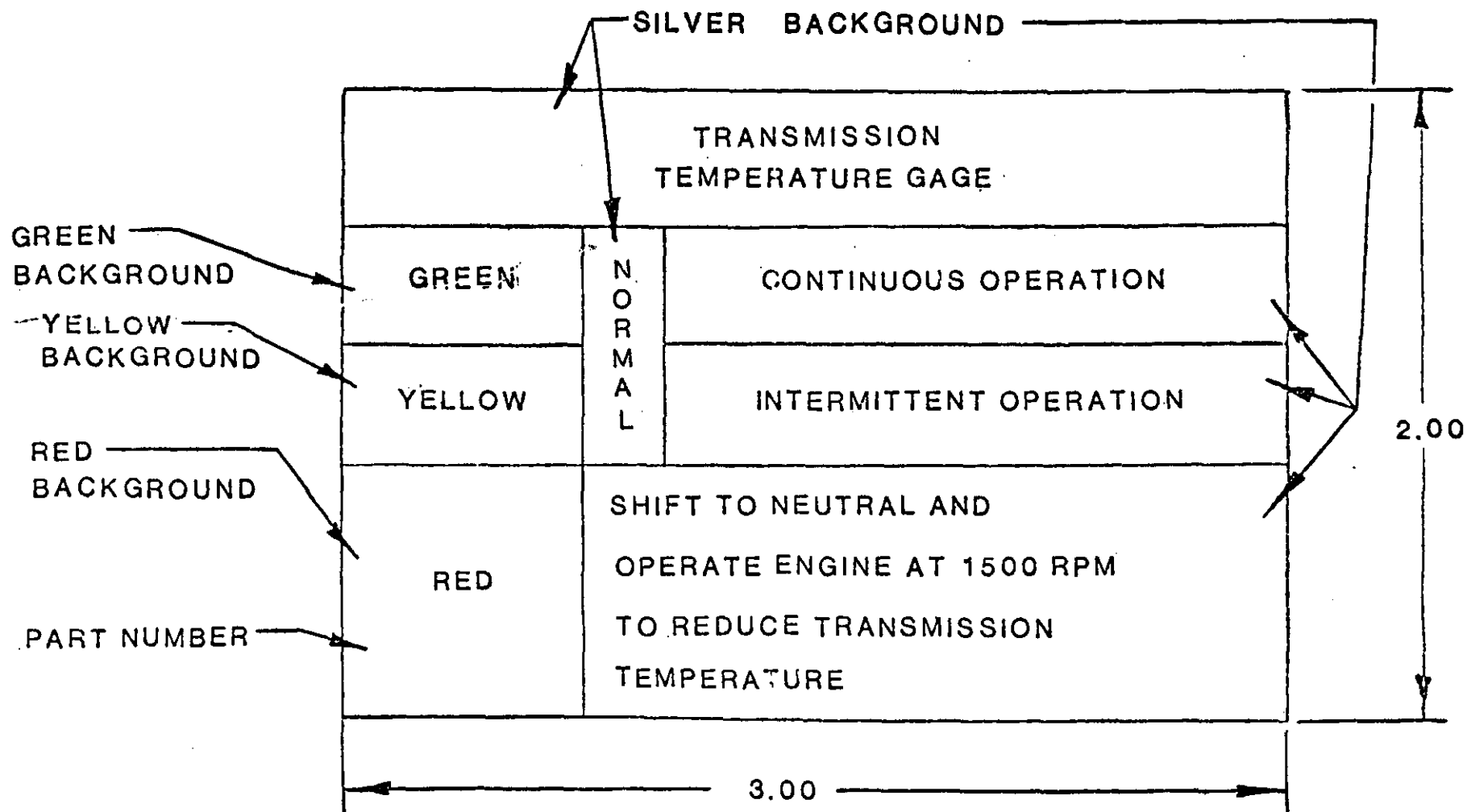
Detroit Diesel Allison
Division of General Motors Corporation

Indianapolis, Indiana 46206

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