3.3 OIL-FILL TUBE AND DIPSTICK DESIGN

The hydraulic-fluid level of the cycling transmissions must be maintained with a safe operating band to ensure proper transmission performance and durability. The fluid level must be maintained above the pump suction-tube port to prevent aeration of the oil resulting in pump cavitation and erratic performance. With the oil level too high, oil may contact rotating parts which would also cause aeration. This condition may be accompanied by overheating or loss of horsepower.

The installation must maintain accessibility to the transmission oil level FULL and ADD check plugs or to the customer-supplied fill tube for ease in performing the required maintenance checks. When the plugs, as located, are inaccessable in the vehicle installation; the vehicle manufacturer should install a fill tube and dipstick assembly to obtain a more suitable location for checking the oil level. When a dipstick is required, consideration must be given to fill tube design in order to meet minimum specifications as outline in the next section.

3.3.1 Fill-tube Requirements

- Fill-tube diameter is governed by the size of the fill-plug opening provided on the transmission. Reference the Basic Installation Drawing for each model.
- Minimum radius of 150 mm (6 in.) in bends to facilitate location of dipstick tube location away from hot objects and still provide easy entry and withdrawal of dipstick.
- Easy access to facilitate addition of oil and oil level checking.
- Anchor upper portion to the engine or transmission, not to the vehicle cab or frame.
- Vent to atmosphere by providing a small hole of .75 mm (.03125 in.) in the top end of the fill tube or cap.

CAUTION: Too high oil level in the transmission, caused by a miscalibrated dipstick or overfill, may force aerated oil out of the fill-tube cap vent. Do not locate fill-tube opening near hot objects, such as the exhaust system, since oil forced out may cause fire.

3.3.2 Dipstick and Cap Assembly

The fill tube cap should be a snug fitting or locking type. This requirement prevents the dipstick assembly from coming out of the transmission during vibration or transmission sump pressure surges. The cap should be included with the dipstick to prevent water or debris from entering the transmission. A vent hole of 0.75 mm (.03125 in.) maximum diameter, which may be located either in the cap or at top of the tube, is necessary for an accurate measurement of oil level.

The oil level markings on the dipstick should be in a horizontal plane with the appropriate check plug centerlines. These markings should be perpendicular to the vertical centerline of the transmission dipstick. These markings will indicate the hot 82 to 93°C (180-200°F) ADD and FULL levels, as specified by the specific oil level check procedure in the various Service Manuals.

The dipstick provides more accurate reading when accordion-type bends, similar to those shown in Figure 3.3-1 are formed in the stick, 38 mm (1.5 in.) above the FULL mark. These bends will prevent the stick from smearing when it is removed for oil level checking.

For clarity of reading the oil level on the dipstick, a black phosphate or oxide coating of the stick is recommended. The ADD and FULL marks should be easily readable. These marks should be located according to the existing ADD and FULL check plug levels on the transmission. Reference the BASIC Installation Drawings listed in section 3.5.1 **Main Pressure** for the check plug locations. Accurate calibration of dipstick markings is imperative to prevent overfilling and aeration of oil.The dipstick should be made of spring steel and should be marked as shown on Figure 3.3-1.

It may be desirable to establish cold level markings for refilling of drained units and for oil-level checks prior to operation. However, because of the variation of external filter and cooling circuits, the location for these markings will vary for each application. The vehicle manufacturer should verify the hot level markings for a dipstick according to Service Manual procedures; then use this calibration to determine the cold level markings.

3.3.3 Checking Oil Level and Oil Fill Procedure

The oil level checking procedure is extremely important since both overfill and underfill conditions can be detrimental to transmission performance and life. All cycling transmissions have two check plugs for FULL and ADD oil levels under operating temperatures. To avoid difficulty, the following steps should be followed:

3.3.3.1 Cold Oil Check.

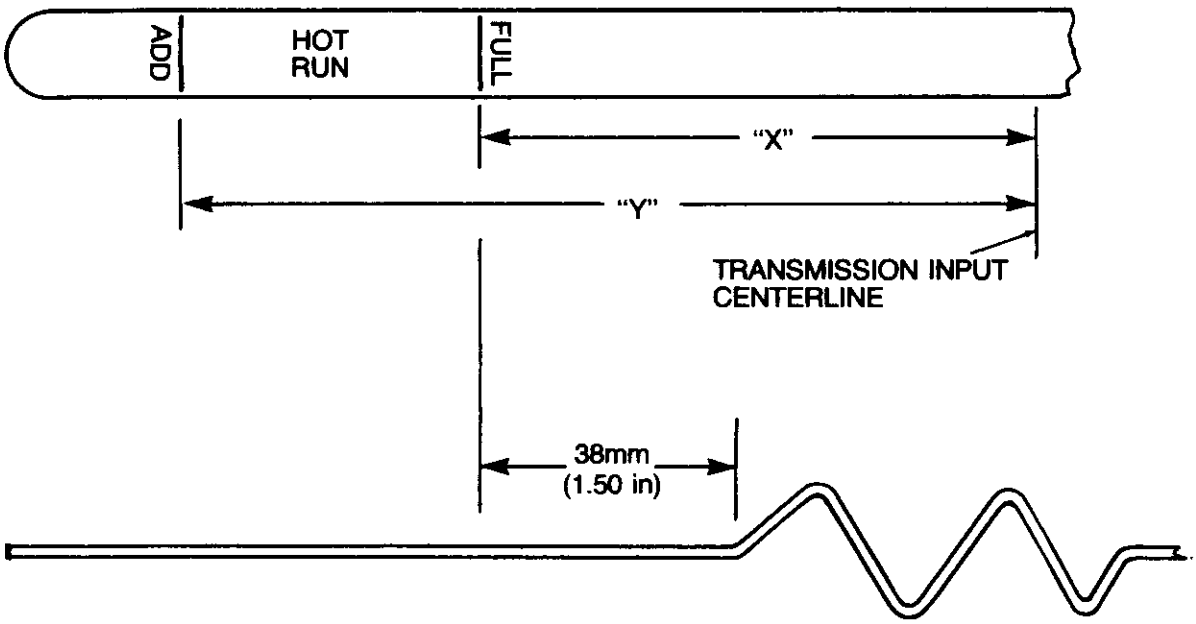
- Before starting engine, be sure oil level is equal to upper FULL plug. Reference Basic Installation Drawing of each model for plug location.
- Operate engine at 1000 to 1500 rpm with transmission in neutral for one minute.
- While the engine is running, add oil as required to establish level at the lower ADD plug. Proceed with the hot oil check.

CAUTION: An oil check made at a lower engine rpm may result in LOW oil level at operating speeds. The cold oil level is indicated at the lower ADD plug, since thermal expansion raises the oil level when the transmission attains operating temperature.

3.3.1.2 Hot Oil Check.

- After cold oil check, run engine at 1000 to 1500 rpm until transmission converter-out temperature reaches 82 to 104°C (180-220°F).
- With the engine at idle speed, shift through all the range positions slowly.
- In neutral, operate engine at 1000 to 1500 rpm, and add or remove oil as required to establish oil level at FULL, the upper plug opening.

CAUTION: Foaming or spurting oil will cause false oil level readings. A true level is indicated by a steady trickle of oil from the plug opening.



Transmission Model	Oil Level Dimensions* millimeters "X"	(inches) "Y"
TRT 2000-3	272.8 (10.74)	292.1 (11.50)
T(R)T 2000-1	447.5 (17.62)	473.0 (18.62)
T(R)T 3000-1	447.5 (17.62)	473.0 (18.62)
T(R)T 4000-1	588.0 (23.15)	613.4 (24.15)
CRT 5633	395.0 (15.55)	487.2 (19.18)
CRT 5643	395.0 (15.55)	487.2 (19.18)

*Dimensions are accurate only for straight and vertical dipstick and fill tube assemblies.

Figure 3.3-1 Hot oil-level dipstick calibration

3.4 TRANSMISSION TEMPERATURE CONTROL

Normal operation of the cycling transmission generates varying amounts of heat due to converter slippage, charging pump losses, and friction in the rotating components. The transmission fluid absorbs this heat and an external hydraulic circuit must be used to provide for a system of heat dissipation. Conversely, during operation in an extremely cold environment, a minimum fluid temperature must be maintained. Several types of cooling systems are available and each has its advantages for a particular installation. Various aspects of transmission temperature control systems will be discussed under the following topics:

- Cooling Systems
- Heat Exchanger Selection
- Temperature Limits
- Installation Considerations
- Cooling Tests

3.4.1 Cooling Systems

Transmission heat must be dissipated to the atmosphere. This may be accomplished directly by an oil-to-air heat exchanger or by an oil-to-water heat exchanger which, in turn, uses the engine water system and the vehicle radiator to transfer the heat to the atmosphere. Some unique applications may require a combination of these two systems.

3.4.1.1 Oil-to-air Heat Exchangers. Oil-to-air heat exchangers have the following advantages:

- Transmission oil with water or ethylene glycol contamination is eliminated, since the oil and engine water system are completely separate.
- The engine water system is not effected by additional plumbing.
- They can be installed with minimal effect on engine cooling.

Disadvantages of the oil-to-air heat exchanger are as follows:

- Space must be available either ahead or behind the engine radiator for the air-to-oil heat exchanger.
- In cold environments, the transmission can be cooled too much by this system. A thermostatically-controlled bypass valve in the cooler line can reduce this problem, but it increases the complexity and the cost. Reference: Section 3.4.3 **Temperature Limits**.
- Engine air flow through the radiator can be affected due to the added restriction of the oil-to-air heat exchanger.

The oil-to-air heat exchanger can be installed in front or behind the engine radiator and utilize the engine cooling fan. Mounting in front of the radiator can affect engine cooling by causing a rise in inlet temperature to the engine radiator.

Oil-to-air heat exchangers could also be remotely mounted from the radiator and have their own cooling fan. This system would have no effect on engine cooling.

3.4.1.2 Oil-to-water Heat Exchangers. Oil-to-water heat exchangers utilize the engine water system for transmission cooling. This type of heat exchanger may be installed in the radiator, or in the cold water line of the engine radiator system. The advantages of the oil-to-water heat exchanger include:

- Use to both warm and cool transmission fluid. The warming will maintain a higher transmission oil temperature in cold environments to improve operating efficiency.
- Is normally a smaller package minimizing the impact on vehicle configuration, expecially when installed in the radiator.
- Engine-mounted coolers normally permit use of the standard vehicle cooling package.

Disadvantages of the oil-to-water heat exchanger include:

- Possible contamination of water or oil systems in the event of heat exchanger leakage.
- Remote-mounted coolers may complicate the vehicle plumbing and/or impact the efficiency of the engine water system.

3.4.1.3 Combination Systems. Combination cooling systems are normally used when a vehicle has an oil-to-water system with adequate cooling capacity for most operating conditions, but it is known that severe operating conditions require greater cooling capacity. An oil-to-air heat exchanger is added to the cooling system to provide the additional capacity required. Care must be exercised with combination systems to prevent excessive cooler-circuit pressure drop limits which are discussed in Section 3.4.4 **Installation Considerations**.

3.4.2 Heat Exchanger Selection

The selection of a heat exchanger to dissipate the transmission heat load is naturally dependent on the type system to used and basic vehicle-design considerations. The following variables and/or limits will be common to all vehicles and must be considered fully:

- engine-water flow, temperature and pressure limits
- cooling-air flow
- transmission temperature and pressure limits
- transmission oil flow
- transmission heat load.

Estimates of these variables will depend on several factors such as type of vehicle, duty cycle, operating conditions, environment, and engine-converter-transmission combination. Therefore, each individual application must be reviewed with the engine and transmission manufacturer to insure a suitable cooler selection.

Selection of the proper heat exchanger capacity requires that the above variables be described. The water flow, temperature, and pressure limit specifications for the engine should be obtained from the engine manufacturer. The cooler manufacturer must supply cooler characteristics which define its ability to transfer heat according to the cooling water or air flow and the transmission fluid flow. Most importantly, the transmission heat load for its application must be determined.

Experience has shown that for most cycling transmission installations, the cooling requirements should be based on continuous cooling at the 70 percent converter efficiency point. The heat rejection at this point can be estimated from a full throttle engine-converter match for a specific

application. This is merely an estimate since transmission-friction inefficiencies have not been included. A typical match for a transmission is shown in Figure 3.4-1. The following relationship may be used to calculate the heat rejection at 70 percent converter efficiency from the typical match:

$$\text{Heat Load} = \text{Output HP}\left(\frac{1}{\text{Eff.}} - 1\right) \quad \frac{42.42\ \text{Btu/min.}}{\text{HP}}$$

$$= 60\left(\frac{1}{0.70} - 1\right) 42.42$$

$$\text{Heat Load} = 1091\ \text{Btu/min.}$$

Transmission oil flow is another factor to be considered when estimating cooling requirements. The transmission oil flow corresponding to 70 percent converter efficiency is a function of engine speed. From the engine converter match in Figure 3.4-1, the engine speed at this point is 2200 rpm. The oil flow in converter operation for this input speed can be obtained from the oil flow curve shown in Figure 3.4-2. In this example the oil flow equals 1.20 liters/second (19.0 gpm). With the heat rejection information and the available oil flow, a properly sized cooler can be selected.

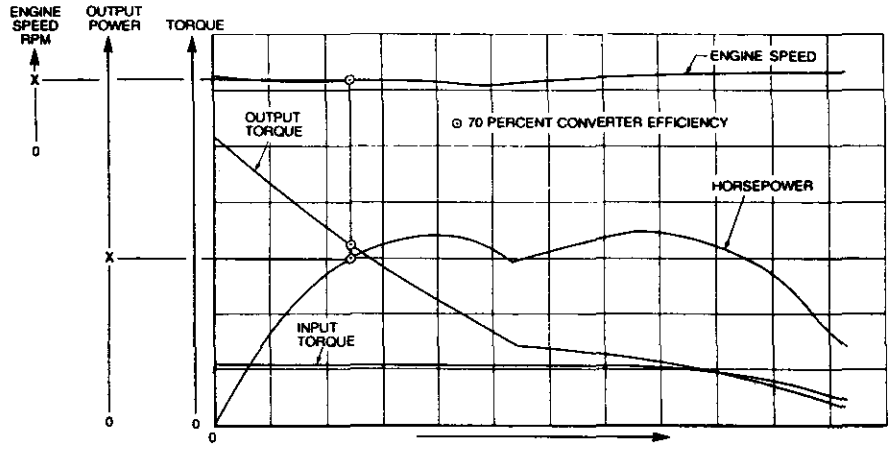


Figure 3.4-1 A typical engine converter match

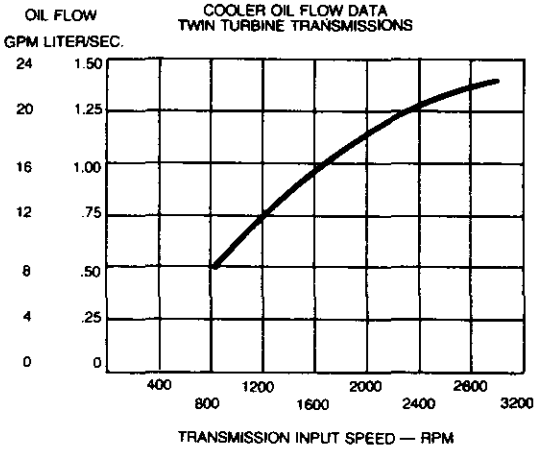


Figure 3.4-2 TT2000 cooler flow

As an example, assume that the amount of heat to be rejected is 19.2 kW (1091 Btu/min.), the transmission oil flow is 1.20 liters/second (19.0 gpm), and the temperature of the oil from the transmission is 121°C (250°F). Assume also that the heat exchanger characteristics are represented by the chart in Figure 3.4-3.

This chart illustrates the performance characteristics of a typical oil-to-water heat exchanger. It is based on an inlet oil temperature of 121°C (250°F); and an inlet water temperature of 85°C (185°F). From Figure 3.4-3, it can be seen that if the inlet temperature of the water to the heat exchanger is maintained at 85°C (185°F), the water flow from the engine to the heat exchanger must be 1.45 liters/second (23 gpm) to dissipate the 19.2 kW (1091 Btu/min). If the engine is unable to supply this minimum water flow at 2200 rpm, then a larger capacity cooler must be selected.

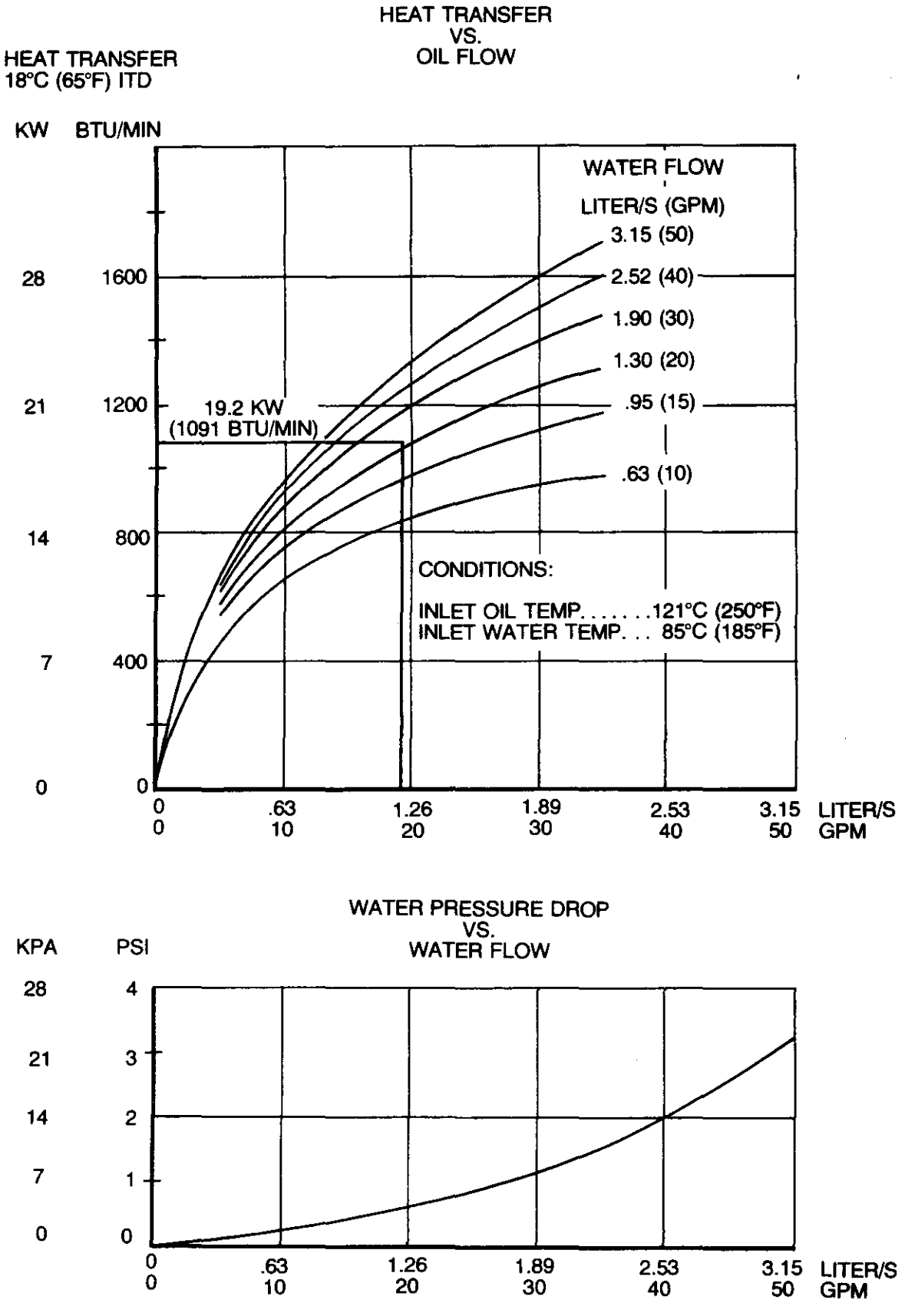


Figure 3.4-3 Typical heat exchanger characteristics

3.4.3 Temperature Limits

Cycling transmission oil temperatures must be maintained below the following limits:

- Maximum Continuous 135°C (275°F)
- Maximum Intermittent 165°C (330°F)

These are maximum values and must be considered for the worst ambient air temperature and load conditions. For the purpose of sizing the transmission cooler and engine radiator based on these converter-out temperatures, an ambient temperature of 43.3°C (110°F) should be assumed unless more specific operating conditions are known. Since oil quality and seal flexibility are adversely affected by high oil temperature, it is well to select a cooler for oil temperatures as low as possible. Minimum sump temperature should be 66°C (150°F) to ensure proper operation of transmission controls. In the event that the vehicle in which the transmission is mounted will be used in arctic service, below -34°C (-30°F), an auxiliary preheat system must be provided for the transmission oil.

3.4.4 Installation Considerations

Cooler circuit specifications and requirements must be followed to ensure maximum converter performance, to eliminate excessive pressure surges during cold starts, and to prevent bypassing of cooler flow during normal operations. For each new installation, these points should be checked to determine whether the circuit should be modified to obtain acceptable pressure and pressure drop.

The transmission external cooler circuit must comply with all of the requirements defined on its specific hydraulic circuit drawing:

Transmission Models	Hydraulic System Installation Drawings
T(R)T 2000	AS 22-004
T(R)T 3000	AS 22-004
T(R)T 4000	AS 42-003
CRT 5633	AS 56-021
CRT 5643	AS 56-026

Exceeding the maximum allowable pressure drop will result in reducing flow to the cooler circuit and a corresponding reduction in cooling capacity. Failure to provide the minimum pressure required will reduce pressure in the converter and affect performance.

3.4.4.1 **Hose.** Recommended hose size will vary with each series of transmission depending upon cooler flows. However, all hoses should conform to hose specification SAE 100R5 and hose standard SAE J1019 in order to be satisfactory to intermittent operation with 165°C (330°F) oil. The hose and tube should be routed for the following conditions:

- avoidance of external heat sources such as exhaust systems,
- avoidance of contact with frame and other components to prevent chaffing,
- connection of "to cooler" oil line to the bottom fitting of the cooler when the transmission oil cooler is installed in a vertical position, such as in a radiator side tank,
- avoidance of line loss by minimizing hose and tube lengths,
- easier connection of the installation,
- protection from road hazards, and
- flexibility of transmission connections.

3.4.4.2 **Low Temperature Use.** We recommend use of a **sump preheater** for operation of the transmission in an environment below -34°C (-30°F). The preheater probe is usually installed in the fill-tube opening of the twin turbine transmission. However, the CRT 5643 has provision for a sump preheater installation in the right sump access cover. As viewed from the transmission input, there is a 1.5-11.5 NPSF tapped opening for heater probes up to 254 mm (10 in.) in length from surface of the opening to the end of the probe. The CRT 5633 currently has no provision or recommended location for a sump preheater.

The twin turbine transmissions offer an **optional thermostat** feature for operation in low temperature environment. The thermostat will cause oil flow to bypass the cooler until the oil reaches a temperature of 99-113°C (210-235°F). The external cooler circuit specifications will not change with this production option.

3.5 MONITORING HYDRAULIC CIRCUIT

Vehicle systems for monitoring main pressure and converter-out temperature should be adapted to all cycling transmissions.

3.5.1 Main Pressure

A gauge indicating transmission oil pressure is recommended for all installations. Main pressure for each transmission series is regulated at the following pressures under FULL-THROTTLE TEST conditions:

Transmission Models	Main Pressure kPa	(psi)
T(R)T 2000	896-1344	(130-195)
T(R)T 3000	896-1344	(130-195)
T(R)T 4000	896-1344	(130-195)
CRT 5633	896-965	(130-140)
CRT 5643	896-965	(130-140)

The size and location of the main pressure taps may be found on the basic Installation Drawing for each model of the transmissions:

Transmission Models	Basic Installation Drawings
T(R)T 2000-1	AS 22-003
TRT 2000-3	AS 22-021
T(R)T 3000	AS 32-001
T(R)T 4000	AS 42-015
CRT 5633 (loader)	AS 56-015
CRT 5633 (nonloader)	AS 56-016
CRT 5633 (straight through)	AS 56-017
CRT 5643	AS 56-024

A pressure gauge is available from Detroit Diesel Allison. If the customer desires to install an alternate gauge, it should be calibrated as follows:

T(R)T 2000, T(R)T 3000, and T(R)T 4000:

	Pressure Gauge Calibration*	
Color Band	kPa	(psi)
RED	0- 897	(0-130)
GREEN	897-1345	(130-195)
RED	1345-1724	(195-250)

CRT5633 and CRT5643:

RED	0- 758	(0-110)
GREEN	758-1033	(110-150)
RED	1033-1378	(150-200)

*NOTE: Pressure range listed includes all operating conditions.

3.5.2 Converter-out Temperature

A warning system for indicating excessive oil temperature is recommended for all transmission installations. All cycling transmissions include a .50-14 NPTF tapped hole, shipped plugged, for a bulb-type temperature-sensing unit. Reference the Installation Drawings in Section 3.5.1 for detailed location of this provision. A temperature gauge and bulb assembly is available from DDA. When the customer desires to install an alternate system, experience has indicated that the tip of the temperature sensing bulb should extend into the oil stream approximately 2.5 mm (0.10 in.) for accurate temperature indication without restriction of the oil flow. This bulb should be connected to a gauge that indicates a maximum continuous operating temperature of 135°C (274°F).

3.5.3 Lubrication Pressure

The twin turbine transmissions and the CRT 5643 do not have a tapped hole to monitor lubrication pressure. When lubrication pressure reading is required for troubleshooting, it is necessary to provide a tee in the line from the cooler for a pressure gauge connector. Lubrication pressures to be maintained for the various model series are given below:

Transmission Model	Lubrication Pressure at Full-throttle Condition kPa	(psi)
T(R)T 2000	130-206	(15-30)
T(R)T 3000	130-206	(15-30)
T(R)T 4000	130-206	(15-30)
CRT 5643	138-241	(20-35)

The CRT 5633 has a .250-18 NPTF tapped hole, shipped plugged, on the left side of the converter housing as viewed from the rear, for lubrication pressure and lube flow for a customer-supplied, side-mounted PTO assembly. Pressure at this opening is maintained at 138-241 kPa (20-35 psi) for a full-throttle condition.

3.5.4 Forward and Reverse Clutch Pressures

The twin turbine transmissions and the CRT 5643 have tapped holes for forward and reverse clutch pressures. These pressures are primarily used for warning devises and disengagement of the parking brake prior to operation. However, these taps may also be used for diagnostic purposes. Reference Section 4.5.1 for details.

4. ACCESSORY PROVISIONS

Depending upon the model options of each particular transmission, the cycling transmissions offer power take-off provisions, magnetic speedometer pickup provisions, mechanical speedometer provisions, parking brake provisions and several special operational control provisions. Included in these groups of accessories is a ground-driven PTO option for emergency steering after engine shut-down, and directional pressure taps for special vehicle controls such as a reverse warning buzzer.

MODELS: T(R)T 2000, T(R)T 3000, T(R)T 4000, CRT 5000

The following subtopics apply to all Allison cycling transmissions, unless otherwise noted.

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List of Figures and Tables

4.1 POWER TAKE-OFF PROVISIONS

The following is a list of all the standard and optional PTO provisions for each cycling transmission model.

Transmission Models	SAE Mounting Provision for Engine-driven PTO Shaft, except at noted (*): Standard	Optional	Optional Emergency Steer (1)*
TT 2000-1	C or B	A	A
TRT 2000-1	C or B	A	-
TRT 2000-3	C or B	A	-
TRT 2010-3	C or B	A	-
TTB 2000-1	C or B	A	-
		Dr. Flange 4N or 1410 (2)*	-
TT 3000-1	C	B	-
TRT 3000-1	C	B	A
TT 4721-1	C	C	-
TRT 4821-1	C	C	-
CRT 5633 (w/loader)	8-bolt (3)*	-	B
CRT 5633 (nonloader)	8-bolt (3)*	C	B
CRT 5633-7 (w/o dropbox)	8-bolt (3)*	C	-
CRT 5643-2	C	C	B

*(1) Output-driven PTO Shaft
(2) Turbine-driven PTO Shaft
(3) Engine-driven PTO Gear

Unique provisions in this list are the turbine driven PTO for the TTB 2000-1 and the emergency-steer PTO for various models. The turbine-driven PTO is used for winching in a log skidder application, while the emergency-steer PTO provides a direct mechanical drive connection to the ground for dead engine, power steering.

4.1.1 PTO Specifications and Ratings

Refer to the PRODUCT DESCRIPTIONS of the various models for power take-off specifications and ratings of each transmission.

4.1.2 Mounting and Installation

A constant supply of lubrication to the drive splines of engine-driven PTO's is standard on all Allison cycling transmissions. Maintenance of constant lubrication is required to ensure maximum spline life. Use of a sealing gasket and pump with a nonvented mounting flange is necessary because of the lubrication provision. For details see the following Installation Drawings:

Transmission Series	PTO for Implement Pump	PTO for Steering Pump	PTO for Emergency Steering
T(R)T 2000	AS 22-030	AS 22-031	AS 22-036
T(R)T 3000	AS 32-004	AS 32-005	———
T(R)T 4000	AS 42-016	AS 42-016	AS 42-018
CRT 5633	———	———	AS 56-023
CRT 5643-2	AS 56-030	AS 56-030	AS 56-023

Provide clean installation. Foreign material of any kind can cause damage and premature failure of the PTO or transmission. Exercise extreme care to prevent dirt, metal chips, or other foreign substances from entering the transmission during installation or during servicing of the PTO.

Installation of Side-mounted PTO, CRT 5633 only. When installing a PTO unit at the side pad on the CRT 5633, careful consideration must be given to backlash and lubrication. The backlash between the PTO drive gear and its mating gear in the assembly should be .005 to .025 inch on the CRT 5633. Excessive, as well as insufficient, backlash can result in damage to the PTO unit and the transmission.

Backlash is controlled by varying the number and/or thickness of the gaskets between the transmission PTO drive pad and the PTO unit. Use the metal shim gaskets supplied with the PTO unit. DO NOT USE THE CORK SHIPPING GASKET under the PTO port cover on the transmission.

Use the following method to determine the backlash between the transmission PTO drive gear and the mating gear in the PTO unit:

1. Determine the backlash in the transmission power takeoff drive gear train.
2. Add this value to the total backlash in the PTO unit.
3. Measure the total backlash of the system after the PTO unit is installed.
4. Subtract the sum in Step 2 from the total backlash of the system.

This difference will be the backlash between the transmission PTO drive-gear and the mating gear in the PTO unit.

It should also be realized during PTO selection that lubrication will be provided by the transmission fluid. The drive gear splashes in oil to provide a passive lube. However, the bearings of some power take-off units require pressure lubrication. For installation of this type, it is permissible to connect an oil line from the PTO unit to the transmission lube pressure tap. It is necessary to restrict this diverted oil with an orifice. The recommended orifice diameter is 1.52 mm (0.060 in.) with a maximum permissible of 2.79 mm (0.110 in.). Refer to Installation Drawing AS 56-005 for location of lube pressure tap.

Should the PTO unit incorporate an hydraulic clutch, the pressure supply can be obtained from the transmission main pressure tap. The location and size of the transmission main pressure tap are shown on the transmission Installation Drawing AS 56-015 or AS 56-016.

After installation of the PTO, the transmission should be carefully checked for proper oil level and for signs of oil leakage. The check should be conducted with the transmission at operating temperature.

4.1.3 Operation of Side-mounted PTO, CRT 5633 Only

Since it is impossible to shift a sliding-gear PTO while the engine is running, use either a constant-mesh or an hydraulic clutch with the engine-driven power takeoff. Refer to the recommendations of the PTO manufacturer for the procedure to engage and disengage an hydraulically-actuated PTO.

4.2 MAGNETIC PICKUP PROVISION FOR SPEEDOMETER

The provision for a magnetic pickup for a speedometer consists of a tapped boss, thread size .750-16 UNF-3B, at the rear of the main housing barrel of twin turbine transmissions.

Refer to the Basic Installation Drawings listed below to obtain data for determining magnetic speed pickup probe length and the speedometer head calibration on the various transmission models. This data includes the distance between the transmission gear tooth and the outside boss surface, number of transmission gear teeth, and mechanical speed ratio from the pickup to the transmission output.

Model	Installation Drawing
TT 2000-1	AS 22-003
TRT 2000-1	AS 22-017 (refers to AS 22-003)
TTB 2000-1	AS 22-026 (refers to AS 22-003)
TT 3000-1	AS 32-001
TRT 3000-1	AS 32-008 (refers to AS 32-001)

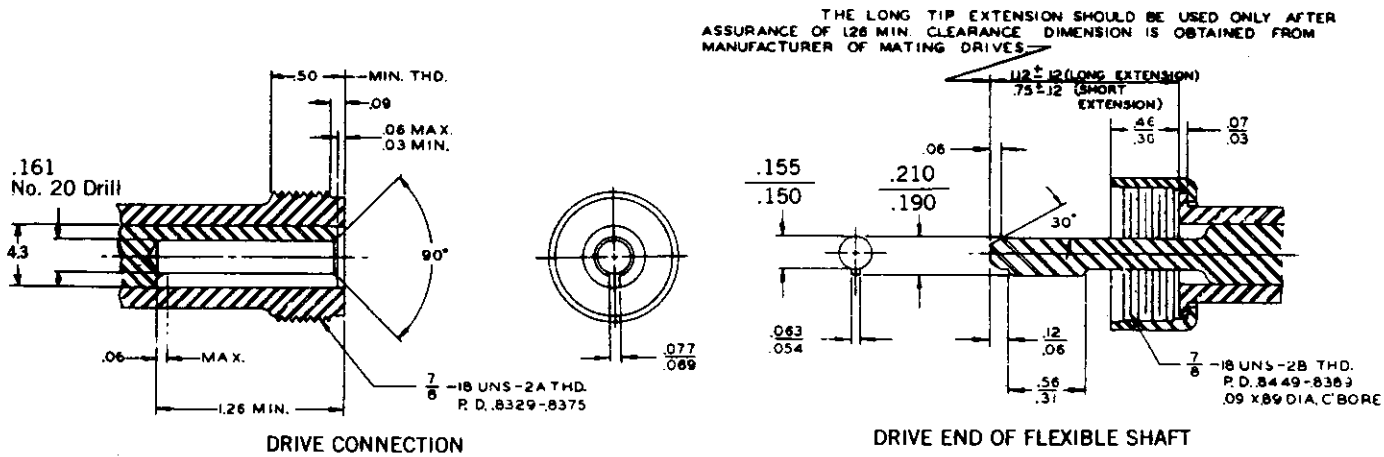
Refer to SUPPORT EQUIPMENT FOR CYCLING TRANSMISSION, for a list of magnetic speedometer-pickup suppliers.

4.3 MECHANICAL DRIVE PROVISION FOR SPEEDOMETER

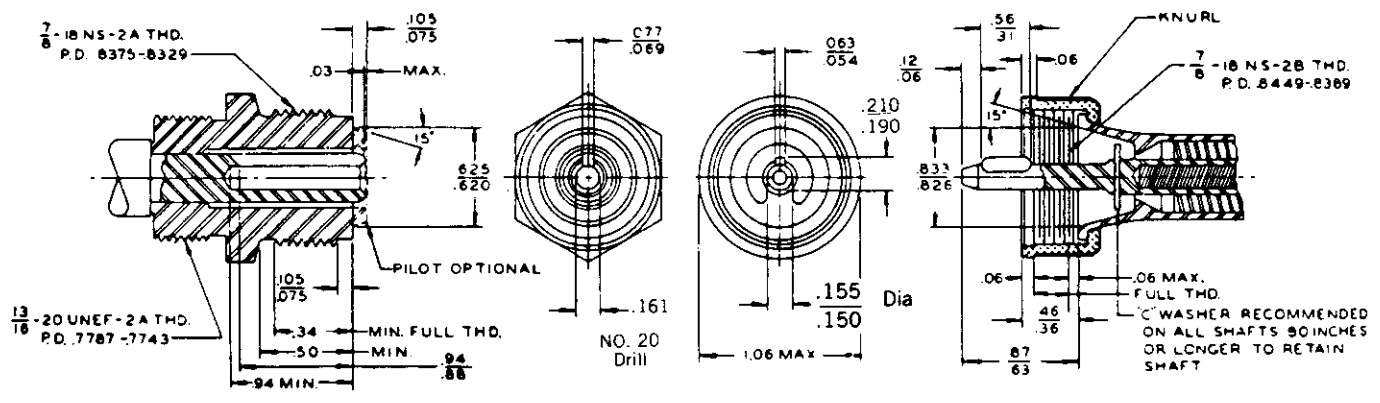
Only the CRT 5633, with a dropbox transfer ratio of 1.0:1, provides for a mechanical drive for a speedometer. The drive is located on the rear of the transmission. Refer to Installation Drawings AS 56-015 and AS 56-016. The SAE specification for this drive is shown in Figure 4.3-1.

The speedometer drive rotates at transmission output speed in the opposite direction of the transmission output rotation.

To minimize the cable load, bend radii should be limited to 152 mm (6.0 in.). When installing the cable, avoid 90° bends if at all possible and limit this to only one where unavoidable.



HEAVY DUTY DRIVE (FOR USE WITH CENTRIFUGAL TYPE INSTRUMENTS)



HEAVY DUTY DRIVE (FOR USE WITH EDDY CURRENT TYPE INSTRUMENTS AND KEY DRIVE OR SQUARE DRIVE)

Adapted from 1980 SAE Handbook, J678e, page 20.03.

Figure 4.3-1 SAE Specification for heavy-duty 5/32 mechanical speedometer drive provision

4.4 PARKING BRAKE PROVISION

A parking brake assembly or a provision for one is available with all twin-turbine transmissions. However, with the CRT's, only the dual-output version of the CRT 5633 offers this option. The brake drum assembly is mounted with a special brake flange bolted at the rear output.

Installation of an air cylinder or mechanical linkage is common for controlling the application of parking brakes. Refer to Section 2.4 of this manual for details of parking brake controls.

Whenever possible, install a light or buzzer that will warn the operator when the parking brake is applied. Brake damage can occur when the vehicle is operated with the brake applied. To further prevent operation while the brake is applied, an interface system can be designed and installed in some vehicles with TT transmissions between the clutch cutoff provision of the transmission and the parking brake.

Specifications for cycling transmissions parking brake provisions are published in the PRODUCT DESCRIPTIONS of the various models.

4.5 SPECIAL OPERATIONAL CONTROL PROVISIONS

Forward clutch and reverse clutch pressure taps and a neutral switch provision are provided for special vehicle manufacturers' control systems on Allison cycling transmissions. These three pressure ports are provided for such vehicle warning systems as: parking brake applied, reverse vehicle movement, and neutral start.

4.5.1 Forward and Reverse Clutch Pressure Taps

The hydraulic pressure at these taps can be used for warning lights, horns, or buzzers to avoid vehicle operation while parking brake is engaged. Also, this pressure may be used to actually disengage parking brakes and/or to give warnings of gear engagement. The reverse pressure is often used to blow a warning horn giving notice of vehicle movement in reverse.

No additional modifications are required by the vehicle manufacturer when these provisions on the transmission are not used, since the tapped pressure holes are sealed with threaded plugs.

Refer to SUPPORT EQUIPMENT FOR CYCLING TRANSMISSIONS, for a list of pressure switch suppliers.

Data on pressure taps for each model is provided in Table 4.5-1 Cycling transmission pressure taps.

Table 4.5-1 Cycling transmission pressure taps

Maximum Pressure Range	Thread Size Forward and Reverse Taps	Installation Drawing	Neutral Start Switch Tap Installation Drawing
MODELS: T(R)T 2421-1, T(R)T 2221-1, TTB 2421-1, TTB 2221-1.			
896-1345 kPa (130-195 psi)	.125-27 NPTF	AS 22-003	AS 00-052
MODELS: TRT 2421-3, TRT 2411-3, TRT 2221-3, TRT 2211-3.			
896-1345 kPa (130-195 psi)	.125-27 NPTF	AS 22-021	AS 00-052
MODELS: T(R)T 3420-1, TRT 3220-1.			
896-1345 kPa. (130-195 psi)	.125-27 NPTF	AS 32-001	AS 00-052
MODELS: TT 4721-1, TRT 4821-1.			
896-1345 kPa (130-195 psi)	.125-27 NPTF	AS 42-015	AS 00-052
MODEL: CRT 5633.			
(not available)	.125-27 NPTF	AS 56-015	
MODEL: CRT 5643.			
(not available)	.125-27 NPTF	AS 56-025	AS 56-028

4.5.2 Neutral Start Switches

Standard on all cycling transmissions is the neutral start switch provision described in Installation Drawing AS 00-052.

The valve body of all cycling transmissions provides one tapped hole with a 9/16-18 UNF-2B thread. The vehicle manufacturer supplies a normally off, linear switch such as: Cole Hersee, part number 92102-03, including the REQUIRED .032-inch washer; or J. Polak, part number 361 B, which does not include the REQUIRED .032-inch washer. The neutral start switch is installed near the vehicle manufacturer-supplied mounting bracket on the Twin Turbine transmission. No additional modification is required when the provision is not used, since the tapped hole is sealed with a washer and threaded plug.

Refer to Support Equipment for Cycling Transmissions, which lists neutral start switch suppliers.

5. INSTRUCTION AND INSTALLATION FOLLOW-UP INFORMATION

Transmission installation design requirements and guidelines can only ensure proper placement and interaction in the vehicle system. A satisfactory application, however, must have operators educated to the transmission functions and the limitations of the powertrain.

In addition, an installation follow-up inspection is advisable to ensure adequate engineering application of the installation requirements contained in this manual and the qualification of assembly instructions and tolerances. In this section, operating instructions and installation inspection items are discussed.

MODEL SERIES: T(R)T 2000, T(R)T 3000, T(R)T 4000, CRT 5000

The following subtopics apply to all Allison cycling transmissions.

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List of Figures

5.1 OPERATING INSTRUCTIONS

Operating instructions should be permanently displayed on a plate or decal in a place where the vehicle operator can easily see it while operating the vehicle. The vehicle manufacturer should include operating instructions in the vehicle operating manual.

A typical decal of operating instructions is shown in Figure 5.1-1. These instructions are discussed below.

Operating Instructions

STARTING ENGINE:	Place the transmission range selector in the neutral position before starting engine. Do not push or tow the vehicle to start the engine.
STARTING VEHICLE:	The engine should be at idle speed prior to shifting from neutral to any driving range. The parking brake should be released.
UPSHIFTING:	Engine full-load governed speed.
MAXIMUM VEHICLE SPEEDS FOR DOWNSHIFTING AT FULL-LOAD GOVERNED SPEED:	_____ MPH in 3-2 Second Range _____ MPH in 2-1 First Range
DIRECTIONAL SHIFTS:	Full-power, full-speed F_1 to R_1 or R_1 to F_1 only.
TOWING VEHICLE:	At low speed for up to one-half mile. If required to tow over one-half mile, disconnect all transmission outputs.

Figure 5.1-1 Typical decal or plate of operating instructions

5.1.1 Starting Engine

Position the range selector control in neutral position while starting the engine or at any time the vehicle is standing unattended. A neutral start switch (optional) will prevent the engine from starting if the range selector is in any other position.

Never push the vehicle in an effort to start the engine. Since there is no output pump to charge the converter, the engine cannot be started and transmission damage can result.

5.1.2 Range Selection

The engine should be at idle speed when a shift is made from neutral to high range. Under load any shift to a higher speed range, in the same direction, can be made at full throttle. Downshift to the next lower speed range may be made at full throttle, under load, providing the vehicle is not exceeding the maximum speed attainable in the lower range. Downshifting at excessive speeds will overspeed the transmission components and the engine causing possible damage.

5.1.3 Directional Shifts

Directional shifts can be made under full-power and/or full-speed conditions in the working ranges (F_1 to R_1 and R_1 to F_1). Directional shifts involving higher ranges (F_2 to R_2, F_3 to R_3, R_2 to F_2, and R_3 to F_3) are prohibited at vehicle speeds greater than those attainable in low ranges because of adverse effects to the service life of the clutch.

5.1.4 Towing

The driveline must be disconnected or the driving wheels must be lifted off the ground anytime the vehicle is pushed or towed more than one-half mile. Failure to comply with this requirement may result in serious damage to the transmission. When the pushing or towing distance is less than one-half mile, the driveline shafts may remain connected; but the vehicle must be towed at a low speed.

5.1.5 Cycling Transmission Optional Operating Instructions

Clutch Cutoff Control. When the transmission is equipped with the clutch cutoff control, the driving clutch is completely released whenever the vehicle brakes are applied. Air or hydraulic pressure which applies the brakes also actuates the clutch cutoff. Thus, with the clutch released, full engine power is available for the PTO-driven equipment without shifting the range selector control to neutral.

Inching Control. Very slight and slow movements of the vehicle can be made with this control. Additional cooling and lubricating oil is supplied to the directional clutch during inching operation in forward low and reverse low range operation. Applying the inching control releases the driving clutch. The inching control may be used during operation in any range except high forward and reverse ranges where it is not recommended because application may slip and damage the range clutch.

Output Disconnect. The transmission front output is disconnected by moving the coupling at the front of the transmission dropbox forward. Rearward movement connects the front and rear output shafts through the splines of the coupling. Two spring-loaded ball detents retain the coupling in either position. Never shift the control while the vehicle is moving because this will damage the splines.

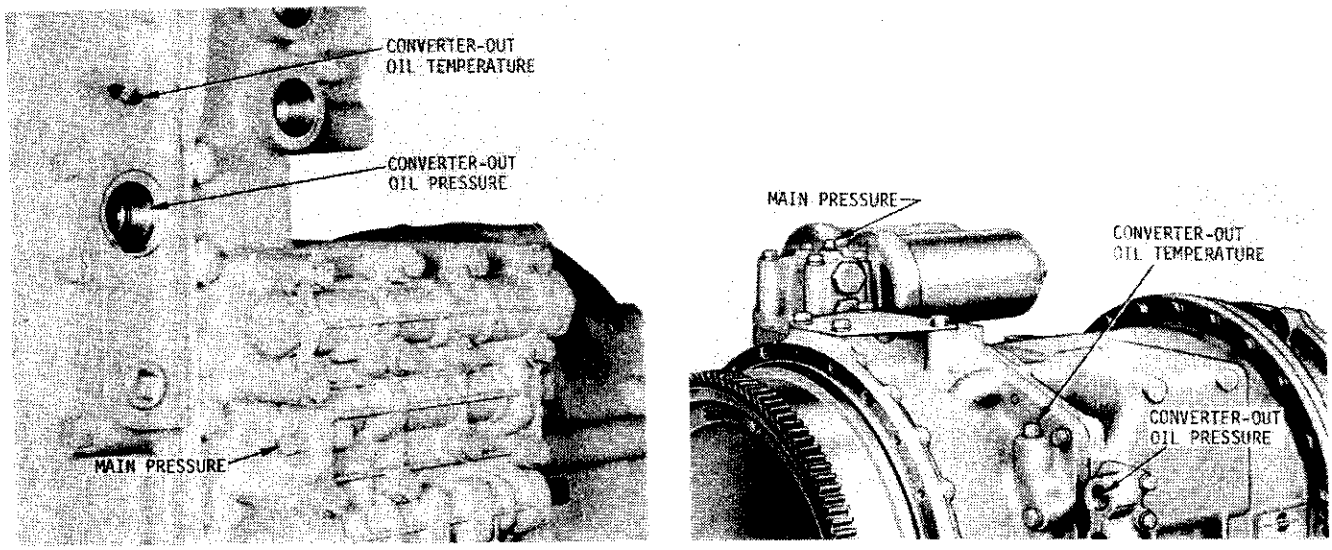
5.1.6 Transmission Oil Temperature

When a transmission is equipped with a temperature gage, the bulb or sending unit is mounted in the converter-out oil stream. Refer to Figure 5.1-2.

The normal operating temperature range is 82-104°C (180-220°F). The maximum continuous converter-out temperature is 135°C (275°F) at an ambient temperature of 43.3°C (110°F).

CAUTION: Temperature may be permitted to reach 165°C (330°F) intermittently, however, extended severe operating conditions at temperatures over 135°C (275°F) should not be permitted.

If the continuous operating temperature reaches this maximum, shift the transmission to neutral and operate the engine at approximately 1000 to 1500 rpm for several minutes until the normal temperature 82-104°C (180-220°F) is restored. If the temperature reaches maximum 135°C (275°F) during normal operation of the transmission, stop the engine and locate the trouble. Continued operation at excessive oil temperature will result in severe transmission damage.



TT 2, 3 AND 4000 TRANSMISSION

CRT 5633 TRANSMISSION

Figure 5.1-2 Transmission oil pressure and temperature ports

5.1.7 Transmission Oil Pressure

Refer to Figure 5.1-2 for the location of the main pressure port when a transmission is to be equipped with a main pressure gage. Shifting or use of the clutch cutoff or inching control will cause fluctuations in the pressure indicated. The main pressure range during operation for the various transmission series in a loader application are listed below:

Transmission Models	Gross Loader Weight kg	lbs	Main Pressure kPa	psi
T(R)T 2000	up to 12701	28000	930-1172	135-170
T(R)T 2000	over 12701	28000	1103-1344	160-195
T(R)T 3000	up to 20412	45000	930-1172	135-170
T(R)T 3000	over 20412	45000	1103-1344	160-195
TT 4721	up to 20412	45000	930-1172	135-170
TT 4721	over 20412	45000	1103-1344	160-195
TRT 4821	up to 30074	66300	930-1172	135-170
TRT 4821	over 30074	66300	1103-1344	160-195
CRT 5000			758-1034	110-150

All other twin-turbine transmission applications will have the 1103-1344 kPa (160-195 psi) main pressure, while the main pressure will remain the same for other CRT 5000 applications.

If abnormal pressures are observed, the unit should be shut down and the problem located. Operation with low oil pressure can cause the clutch to slip and result in severe transmission damage.

5.2 INSTALLATION FOLLOW-UP

The transmission is part of the powertrain and its successful operation is dependent upon a correct interface with other components in this system. The most thoroughly considered installation design can still result in transmission damage due to oversights during the actual mounting of the transmission in the vehicle.

To isolate and correct any installation oversights, it is essential to thoroughly inspect the installation work before the vehicle is put into service. The following form is an example of the INSTALLATION INSPECTION SHEET which should be used after a new cycling transmission installation or after a service or repower installation.

TRANSMISSION INSTALLATION INSPECTION REPORT

Date _____ No. _____

Vehicle: Make-Model _____ Vehicle No. _____ Odometer _____ km _____ Miles

Engine: Make-Model _____ Rated Power _____ Hourmeter _____

Transmission: Model _____ S/N _____ Assy. No. _____

NOTE: Inspect each system. Circle condition found.

1. TRANSMISSION MOUNTING:			
Flywheel Housing Bolts	LOOSE	TIGHT	
Trunnion Mounting	LOOSE	TIGHT	
Rear Mounting Bolts	LOOSE	TIGHT	
Isolator Pads	INSTALLED	BAD CONDITION	OK
2. TRANSMISSION OIL COOLING SYSTEM:			
External Leaks	WATER	OIL	NONE
Oil in Radiator	EXCESSIVE	SLIGHT	NONE
Coolant Water in Transmission Oil	FOUND WATER	PURE OIL	
Cooler Lines	SWITCHED	WELL ROUTED	
Hoses and Fittings	WORN	RUBBING	GOOD
3. TRANSMISSION OIL FILTER SYSTEM:			
External Leaks	EXCESSIVE	SLIGHT	NONE
Filter Lines	SWITCHED	WELL ROUTED	
Hoses and Fittings	WORN	RUBBING	GOOD
Filter	DIRTY	CLEAN	
4. TRANSMISSION OIL AND OIL LEVEL:			
C3 Oil	WRONG OIL	OK	
Oil Quality	DIRTY	CLEAN	
Oil Condition	FOAMING	NOT FOAMING	
Oil Level	LOW	OVERFILLED	CORRECT
Dipstick	WRONG LENGTH	MARKED WRONG	OK
5. HYDRAULIC PUMPS:			
Mounting Bolts	LOOSE	TIGHT	
Hose Clamps	LOOSE	TIGHT	
6. TRANSMISSION DRIVELINE:			
Flange or Yoke Bolts	LOOSE	TIGHT	
Balance Weights	MISSING	OK	
Yoke Phasing	IMPROPER	OK	
Driveline Angles	IMPROPER	OK	
Driveline Bearings	WORN	LOOSE	
Driveline Flanges	NOT ALIGNED	OK	
Driveline Slip Spline	WORN	NEEDS LUBE	OK
7. TRANSMISSION SHIFT CONTROLS:			
Mechanical:			
Shift Tower	MISADJUSTED	BINDING	FEEL DETENT
Gate	MISADJUSTED	PROPER	
Rod	FLEXIBLE	RIGID	
Joints	BINDING	FREE	
Clevis Pin:			
At Directional Spool	BINDS	FREE, SECURE	
At Range Spool	BINDS	FREE, SECURE	
Cable	BINDS	FREE	
Cable End Connections	LOOSE	TIGHT	

TRANSMISSION INSTALLATION INSPECTION REPORT (continued)

Air:			
Stroke	NO DETENT	FEEL DETENT	
Pressure Level	LOW	LEAKING	OK
Cylinder Action	ERRATIC	SMOOTH	
Routing of Lines	INCORRECTLY ROUTED OR SUPPORTED	OK	
Electric Range Shift (Test Kit)	ERRATIC	CHECKS OK	
Electric Control Connections	LOOSE	TIGHT	
8. ENGINE OPERATION, SPEED, rpm:			
Neutral, No Load Gov. Speed (WOT)	HIGH	LOW	_____ rpm
Neutral Range, Idle	HIGH	LOW	_____ rpm
High Range, Converter Stall (WOT)	HIGH	LOW	_____ rpm
Vibrations	EXCESSIVE	SLIGHT	NONE
9. TRANSMISSION OIL PRESSURE, psi:			
All Ranges except Neutral Main Pressure	HIGH	LOW	_____ psi
Neutral, to Cooler	HIGH	LOW	_____ psi
Drop across Cooler	HIGH	LOW	_____ psi
Neutral, to Filter	HIGH	LOW	_____ psi
Neutral, Filter Return	HIGH	LOW	_____ psi
Drop across Filter	HIGH	LOW	_____ psi
10. POWER TAKEOFF:			
Mounting Bolts	LOOSE	TIGHT	
Lubed from Transmission Lube Pressure Tap	NO	YES	
Drive Gear Backlash	INCORRECT	OK	
11. INSTRUMENTATION:			
Pressure Gage	NOT WORKING	OK	
Temperature Gage	NOT WORKING	OK	
12. TRANSMISSION FUNCTIONS:			
Neutral Start Switch	REPLACE	OK	
Drives in all Ranges	NO	YES	
Inching Control	ADJUST	OK	
Clutch Cutoff	REPAIR	OK	
Front Output Disconnect	ADJUST	OK	
Parking Brake Applies	ADJUST	OK	
Reverse Warning Switch	REPLACE	OK	
Transmission Oil Temperature	OVERHEATS	OK	_____ °F or _____ °C

OTHER COMMENTS ON INSTALLATION:

_____

_____

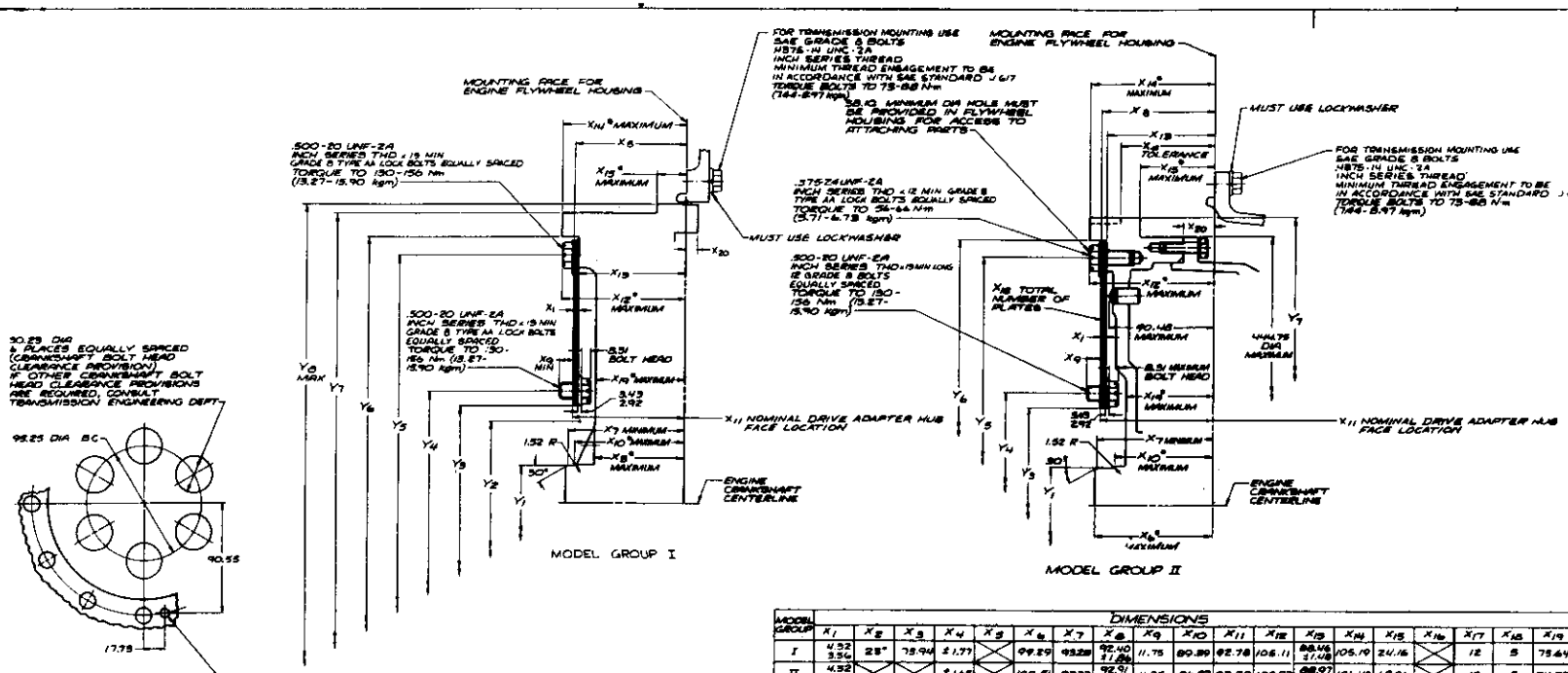
_____

_____

_____

INSPECTOR SIGNED_____ **REPAIRS COMPLETED AND APPROVED**_____

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



MODEL GROUP	DIMENSIONS																			
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
I	4.52 3.56	28°	78.94	±1.77		99.29	93.28	92.40 ±1.84	11.75	80.39	92.78	106.11	88.46 ±1.48	105.19	24.16		12	5	75.44	9.96 ±1.38
II	4.52 3.56			±1.65		100.51	93.77	92.91 ±2.54	11.25	84.87	93.29	108.97	88.97 ±2.21	106.48	69.96		12	5	74.73	25.60 ±1.38

GROUP	MODEL
I	TC-500 CRT-5000 CLT-5,6000
II	TC-400 MMBO 700 SERIES

MODEL GROUP	DIAMETERS							
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8
I	61.87 61.85	86.45 83.38	159.08 158.78	184.15	406.40	V38.91 V37.39	N77.82 N76.25	N95.30
II	61.87 61.82		159.08 158.78	184.15	406.40	V38.91 V37.39	N77.77 N76.25	

ALL PHYSICAL ADAPTATION DESIGNS SHOULD BE REVIEWED BY DETROIT DIESEL ALLISON DIV GMC TRANSMISSION ENGINEERING DEPT.

STARTER RING GEAR AND CRANKSHAFT ADAPTER NOMINAL DIMENSIONS DEPEND UPON ENGINE SPECIFICATIONS SEE AS 00-002 FOR RECOMMENDATIONS AND REQUIREMENTS

* DENOTES FUNCTIONAL DIMENSIONS WHICH INCLUDE .762 MM MAX CONV BALLOONING

AS 00-002

METRIC
ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED
THIRD ANGLE PROJECTION

Allison Transmission

TRANSMISSION DRIVE ADAPTATION CHART
SEE CHART
AS 00-001

MILLIMETRES TO INCHES

mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX	mm MIN/NOM	mm MAX	in. MIN/NOM	in MAX
	.13		.005		104.90		4.13
					105.44		4.151
					105.99		4.173
							4.29
1.02		.040					
1.07		.042					
1.12		.044		133.35	136.65	5.25	5.38
1.22		.048					
1.32		.052		158.78	159.03	6.251	6.261
1.40		.055		184.15		7.250	
1.52		.06					
1.60		.063					
1.65		.065		406.40		16.00	
				437.39	438.91	17.22	17.28
2.92	3.43	.115	.135				
3.56	4.32	.140	.170		444.75		17.51
6.35		.250		476.25	477.77	18.75	18.81
7.14		.2813			495.30		19.50
	8.31		.327				
11.28	11.81	.444	.465				
11.73	11.84	.4619	.4662				
12.70		.50					
17.73		.698					
	23.88		.94				
30.23		1.19					
38.10		1.50					
61.82	61.87	2.434	2.436				
64.52		2.54					
	73.41		2.89				
	73.91		2.910				
	73.96		2.912				
88.75		3.494					
	88.95		3.502				
89.28		3.515					
90.55		3.565					
	90.68		3.57				
	90.86		3.577				
92.68		3.649					
93.22		3.670					
94.03		3.702					
94.49		3.72					
94.57		3.723					
94.67		3.727					
95.25		3.75					
95.68	99.62	3.767	3.922				
95.76	98.81	3.77	3.89				
102.11	104.90	4.02	4.13				

METRIC VALUES	EQUIVALENTS
56-66 Nm	41-49 POUND FEET
130-156 Nm	96-115 POUND FEET
73-88 Nm	54-65 POUND FEET
56-66 Nm	41-49 POUND FEET

ADDITIONS CHANGE F

MILLIMETRES TO INCHES

mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
1.35		.053	
1.48		.058	
1.55		.061	
1.77		.069	
1.86		.073	
2.27		.089	
2.65		.104	
9.96		.392	
11.51		.453	
12.58		.495	
24.16		.951	
25.60		1.007	
61.85		2.435	
69.96		2.754	
73.64		2.899	
73.94		2.911	
74.64		2.938	
74.73		2.942	
86.87		3.420	
88.46		3.482	
88.97		3.502	
89.39		3.519	
	90.48		3.562
92.29		3.633	
92.40		3.637	
92.78		3.652	
92.91		3.657	
93.28		3.672	
93.29		3.673	
93.77		3.691	
99.29		3.909	
100.51		3.957	
105.11		4.138	
105.19		4.141	
105.97		4.172	
106.48		4.192	
477.82		18.811	

MILLIMETRES TO INCHES

mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
	.13		.005
1.02		.040	
1.07		.042	
1.12		.044	
1.22		.048	
1.32		.052	
1.40		.055	
1.52		.06	
1.60		.063	
1.65		.065	
2.92	3.43	.115	.135
3.56	4.32	.140	.170
6.35		.250	
7.14		.2813	
	8.31		.327
11.28	11.81	.444	.465
11.73	11.84	.4619	.4662
12.70		.50	
17.73		.698	
	23.88		.94
30.23		1.19	
38.10		1.50	
61.82	61.87	2.434	2.436
64.52		2.54	
	73.41		2.89
	73.91		2.910
	73.96		2.912
88.75		3.494	
	88.95		3.502
89.28		3.515	
90.55		3.565	
	90.68		3.57
	90.86		3.577
92.68		3.649	
93.22		3.670	
94.03		3.702	
94.49		3.72	
94.57		3.723	
94.67		3.727	
95.25		3.75	
95.68	99.62	3.767	3.922
95.76	98.81	3.77	3.89
102.11	104.90	4.02	4.13

mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
	104.90		4.13
	105.44		4.151
	105.99		4.173
			4.29
133.35	136.65	5.25	5.38
158.78	159.03	6.251	6.261
184.15		7.250	
406.40		16.00	
437.39	438.91	17.22	17.28
	444.75		17.51
476.25	477.77	18.75	18.81
	495.30		19.50

METRIC VALUES	EQUIVALENTS
56-66 Nm	41-49 POUND FEET
130-156 Nm	96-115 POUND FEET
73-88 Nm	54-65 POUND FEET
56-66 Nm	41-49 POUND FEET

ADDITIONS CHANGE F

MILLIMETRES TO INCHES

mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
1.35		.053	
1.48		.058	
1.55		.061	
1.77		.069	
1.86		.073	
2.27		.089	
2.65		.104	
9.96		.392	
11.51		.453	
12.58		.495	
24.16		.951	
25.60		1.007	
61.85		2.435	
69.96		2.754	
73.64		2.899	
73.94		2.911	
74.64		2.938	
74.73		2.942	
86.87		3.420	
88.46		3.482	
88.97		3.502	
89.39		3.519	
	90.48		3.562
92.29		3.633	
92.40		3.637	
92.78		3.652	
92.91		3.657	
93.28		3.672	
93.29		3.673	
93.77		3.691	
99.29		3.909	
100.51		3.957	
105.11		4.138	
106.19		4.141	
105.97		4.172	
106.48		4.192	
~~[illegible]~~		~~18.011~~	

AS00-001

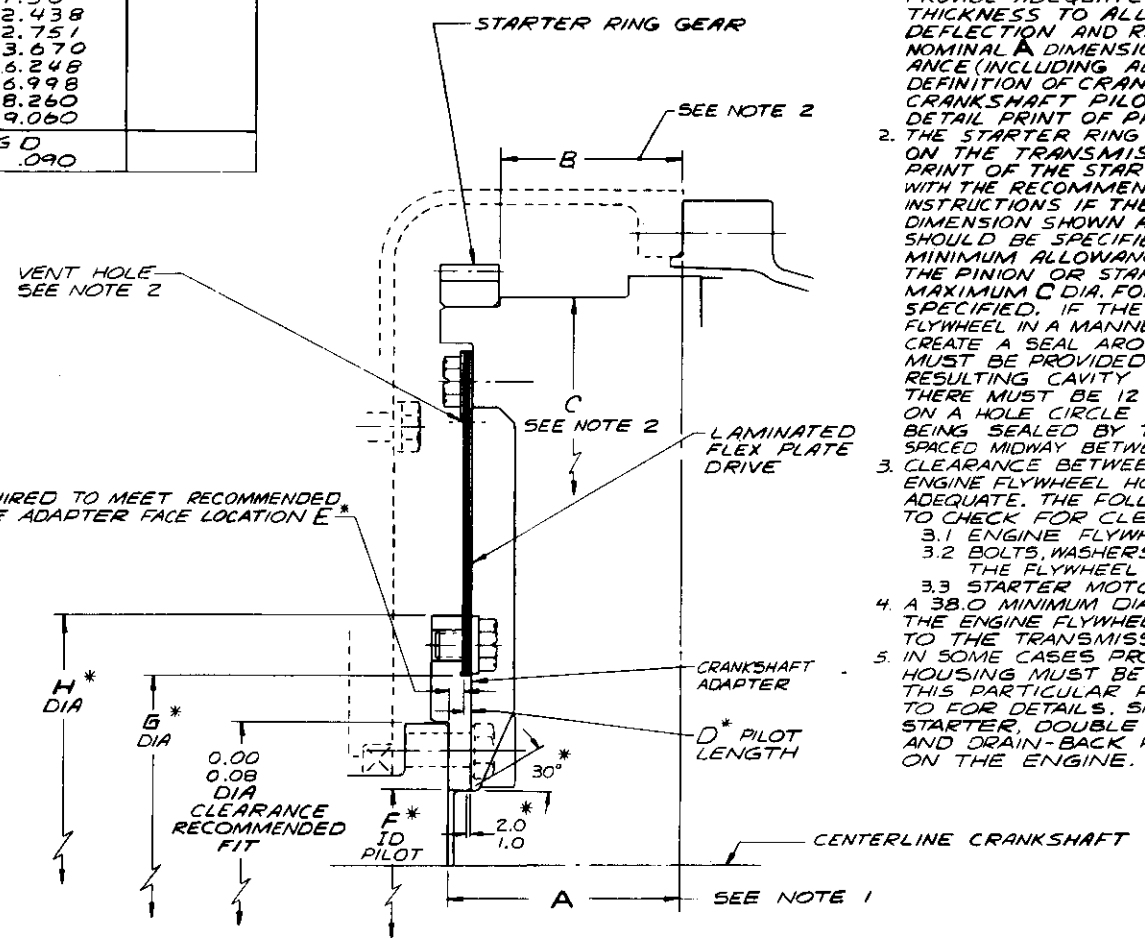
MILLIMETRES TO INCHES			
mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
0.03		.001	
0.05		.002	
0.08		.003	
1.17		.046	
1.27		.050	
1.0	2.0	.04	.08
3.99		.157	
5.64		.222	
38.0		1.50	
61.93		2.438	
69.88		2.751	
93.22		3.670	
158.70		6.248	
177.75		6.998	
209.80		8.260	
230.12		9.060	
ADDITIONS - CHG D			
2.30		.090	

ITEM	ADAPTATION CHART	
	AS 00-001	AS 00-015
D	3.99±0.05	5.64±0.05
E	SEE AS00-001 *11	93.22±1.17
F	61.93±0.03	69.88±0.03
G	158.70±0.05	177.75±0.05
H	209.80±1.27	230.12±1.27

THE SKETCH AT THE LEFT SHOWS THE GENERAL DRIVE ARRANGEMENT FOR ENGINE-MOUNTED DETROIT DIESEL ALLISON TORQMATIC CONVERTERS AND TRANSMISSIONS. TO OBTAIN A SATISFACTORY ENGINE AND CONVERTER ADAPTATION, CERTAIN REQUIREMENTS MUST BE OBSERVED FOR THE SPECIFIC ENGINE TO BE USED. THE FOLLOWING IS A SUMMARY OF THESE GENERAL REQUIREMENTS AND THE INFORMATION WHICH MUST BE FORWARDED TO THE DETROIT DIESEL ALLISON TRANSMISSION ENGINEERING DEPARTMENT PRIOR TO MAKING A PRELIMINARY ADAPTATION STUDY OF AN ADAPTATION MADE BY THE ENGINE MANUFACTURER OR EQUIPMENT BUILDER:

1. THE CRANKSHAFT ADAPTER MUST BE DESIGNED TO PROVIDE ADEQUATE PILOTING AND MUST BE OF THE PROPER THICKNESS TO ALLOW A MINIMUM FLEX PLATE DRIVE DEFLECTION AND RESULTANT LOADING. PROVIDE THE NOMINAL **A** DIMENSION SHOWN AT LEFT AND TOTAL TOLERANCE (INCLUDING ALLOWABLE CRANKSHAFT END PLAY), DEFINITION OF CRANKSHAFT ATTACHING BOLT CIRCLE, AND CRANKSHAFT PILOT DIA. AND TOLERANCE. FURNISH DETAIL PRINT OF PROPOSED ADAPTER IF AVAILABLE.
2. THE STARTER RING GEAR MUST BE PROPERLY LOCATED ON THE TRANSMISSION FLYWHEEL. A REPRODUCIBLE PRINT OF THE STARTER RING GEAR SHOULD BE PROVIDED WITH THE RECOMMENDED PRESS FIT AND ASSEMBLY INSTRUCTIONS IF THE GEAR IS NOT SYMMETRIC. THE **B** DIMENSION SHOWN AT LEFT FOR OPTIMUM ENGAGEMENT SHOULD BE SPECIFIED ALONG WITH THE MAXIMUM AND MINIMUM ALLOWANCE TO AVOID INTERFERENCE WITH THE PINION OR STARTER MOTOR WHILE RUNNING. THE MAXIMUM **C** DIA. FOR CLEARANCE SHOULD BE SPECIFIED. IF THE STARTER RING GEAR IS BOLTED TO THE FLYWHEEL IN A MANNER THAT CAUSES THE FLEX PLATE TO CREATE A SEAL AROUND THE FLEX PLATE O.D., VENT HOLES MUST BE PROVIDED IN THE FLEX PLATES TO VENT THE RESULTING CAVITY BETWEEN THE FLYWHEEL AND FLEX PLATES. THERE MUST BE 12 VENT HOLES, 2.30 DIA MIN. LOCATED ON A HOLE CIRCLE DIA AS LARGE AS POSSIBLE WITHOUT BEING SEALED BY THE RESULTING ASSEMBLY, EQUALLY SPACED MIDWAY BETWEEN THE OUTER BOLT HOLES.
3. CLEARANCE BETWEEN THE TRANSMISSION FLYWHEEL AND THE ENGINE FLYWHEEL HOUSING AND ATTACHING PARTS MUST BE ADEQUATE. THE FOLLOWING DRAWINGS SHOULD BE PROVIDED TO CHECK FOR CLEARANCE:
   - 3.1 ENGINE FLYWHEEL HOUSING DETAIL.
   - 3.2 BOLTS, WASHERS, AND OTHER PARTS WHICH EXTEND INTO THE FLYWHEEL HOUSING CAVITY.
   - 3.3 STARTER MOTOR ASSEMBLY AND LOCATING SHIMS
4. A 38.0 MINIMUM DIA ACCESS HOLE MUST BE PROVIDED IN THE ENGINE FLYWHEEL HOUSING FOR BOLTING THE FLEX PLATE TO THE TRANSMISSION FLYWHEEL AT ASSEMBLY.
5. IN SOME CASES PROVISION FOR A WET TYPE FLYWHEEL HOUSING MUST BE MADE. THE INSTALLATION DRAWING FOR THIS PARTICULAR PRODUCT SHOULD BE REFERRED TO FOR DETAILS. SPLITLINE GASKETS, SEALED STARTER, DOUBLE SEAL ON THE CRANKSHAFT AND DRAIN-BACK PROVISION MUST BE SUPPLIED ON THE ENGINE.

AS00-002



STARTER RING GEAR AND CRANKSHAFT ADAPTER NOMINAL DIMENSIONS DEPEND UPON ENGINE

ENGINE CONCENTRICITY AND FLATNESS REQUIREMENTS PER DETROIT DIESEL ALLISON INSTALLATION MANUAL

REFER TO AS 00-001 OR AS 00-015 FOR DIMENSIONS OF TORQMATIC CONVERTERS AND TRANSMISSIONS WHICH ARE REQUIRED FOR DETAILED ADAPTATION STUDIES.

*RECOMMENDED ADAPTER DIMENSIONS WITH STANDARD DETROIT DIESEL ALLISON FLEX PLATE DRIVE.

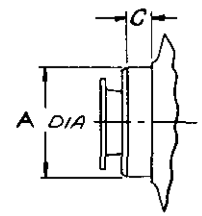
METRIC

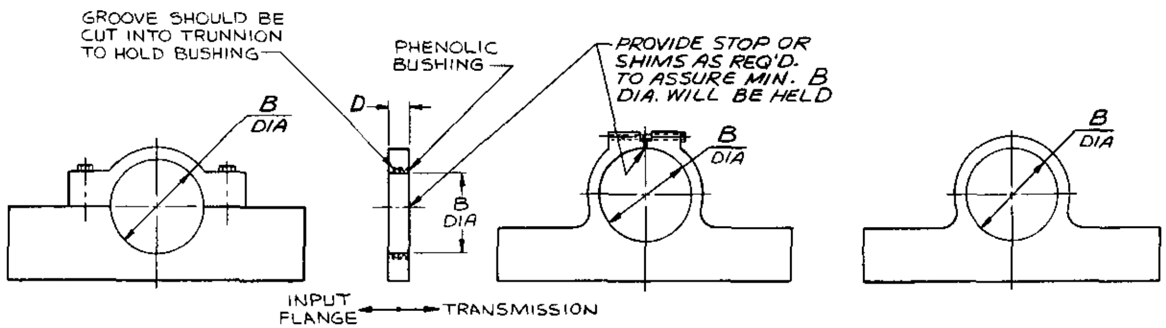
Allison Transmissions

HUGHES	ST. JOHN	ATS	TITLE ENGINE-TRANSMISSION/CONVERTER ADAPTATION REQUIREMENTS
FULL	ST. JOHN	BONHAM	MODEL VARIOUS — AS 00-002

METRIC TO INCHES			
MM MIN/NOM	MM MAX	IN MIN/NOM	IN MAX
25.40		1.000	
28.96		1.140	
31.75		1.250	
35.05		1.380	
38.10		1.500	
40.13		1.580	
45.21		1.780	
139.67	139.73	5.499	5.501
139.85	139.98	5.506	5.511
152.27	152.40	5.995	6.000
152.53	152.65	6.005	6.010
183.97	184.10	7.243	7.248
184.23	184.35	7.253	7.258
304.67	304.80	11.995	12.000
304.93	305.05	12.005	12.010

TRANSMISSION TRUNNION SUPPORT REQUIREMENTS				
A DIA	B DIA	C DIM.	D DIM.	APPLICATION
152.40 152.27	152.65 152.53	28.96	25.40 MIN	T(R)T 2400
184.10 183.97	184.35 184.23	45.21	38.10 MIN	5/6000 SERIES 700 SERIES
184.10 183.97	184.35 184.23	40.13	31.75 MIN	
139.73 139.67	139.98 139.85	35.05	31.75 MIN	
304.80 304.67	305.05 304.93	45.21	38.10 MIN	DP 8000 CLBT 9000





TYPICAL CONSTRUCTION OF TRUNNION SUPPORTS

AS 00-003

IF BUSHING IS NOT USED THEN FULL-ROUND LENGTH OF V-BELT IS REQUIRED ON FRONT TRUNNION MOUNTING SURFACE (CONTACT) V-BELT MANUFACTURER FOR GROOVE AND BELT SPECIFICATIONS)

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

CHANGES				
J				
H				
G				
F				
E				
D	17JA81	ADDED BUSHING INFORMATION	VT	[illegible]
C	8-14-78	REDRAWN	[illegible]	[illegible]
B	0-19-68	ADD 12" TRUNNION	DH	
A	1-8-62	REV. & REDRAWN	DH	[illegible]

Allison Transmissions

HUGHES 1-14-60	R.L.H. 1-19-60	RTS 1-20-60
SCALE NONE	MUELLER 1-14-60	WELCHER 1-[illegible]

TITLE: TRANSMISSION TRUNNION SUPPORT

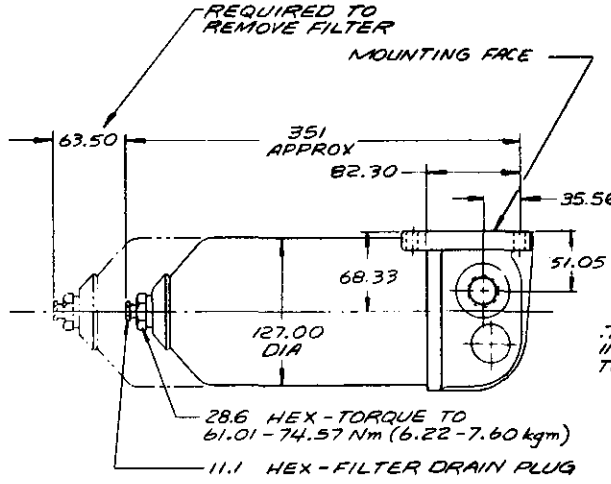
MODEL SEE BASIC INSTALLATION DRAWINGS — AS 00-003

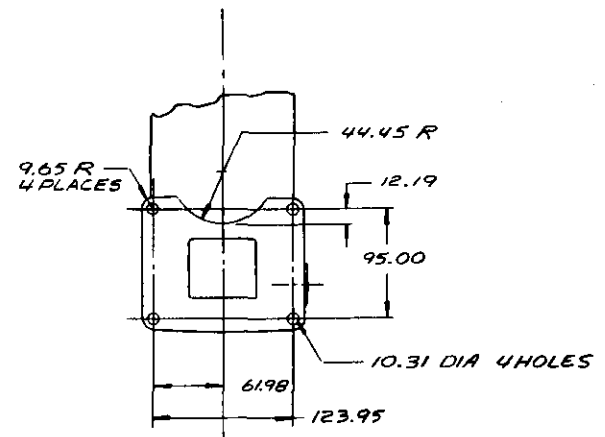
Detroit Diesel Allison Division of General Motors · Indianapolis, Indiana

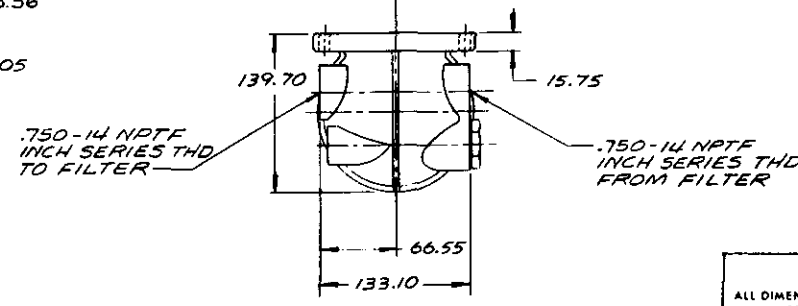
MILLIMETRES TO INCHES			
mm MIN./NOM	mm MAX	in. MIN/NOM	in. MAX
9.65		.38	
10.31		.406	
11.1		.4375	
12.19		.48	
15.75		.62	
28.6		1.125	
35.56		1.40	
44.45		1.75	
51.05		2.01	
61.98		2.44	
63.50		2.50	
66.55		2.62	
68.33		2.69	
82.30		3.24	
95.00		3.74	
123.95		4.88	
127.00		5.00	
133.10		5.24	
139.70		5.50	
351.		13.82	

METRIC VALUES	EQUIVALENTS
61.01 Nm	45 LB FT
74.57 Nm	55 LB FT
83-103 kPa	12-15 PSI

CAUTION :
FILTER MUST BE MOUNTED AS SHOWN OR WITH ELEMENT DOWN TO AVOID AIR ENTRAPMENT INSIDE SHELL







1500-004

INTEGRAL BY-PASS VALVE OPENING PRESSURE 83-103 kPa (.84-1.05 kg/cm²)

BASE AND FILTER ASSEMBLY A C DIVISION G.M.C.
OEM ASSEMBLY PART NUMBER 5575208
RESALE PACKAGE ASSEMBLY PART NUMBER 5575224
REPLACEMENT FILTER ELEMENT PACKAGE
TYPE PF-132 PART NUMBER 5573014

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

Allison Transmissions

TITLE: SINGLE FILTER INSTALLATION DATA
MODEL VARIOUS | AS00-004

Detroit Diesel Allison Division of General Motors Indianapolis, Indiana

The grease used in the input drive ring for the TC-300 Converter and the CRT-3331 Transmission, must meet the following specification:

"High quality wheel bearing type grease. Must not attack Buna or Polyacrylate rubber compounds and shall show no separation when centrifuged in accordance with ASTM D91-52, paragraph 36 for 30 minutes immediately after heating to 250°F."

CHANGES				
J				
H				
G				
F				
E				
D				
C				
B				
A				

GM GENERAL MOTORS

Allison TORQMATIC Drives

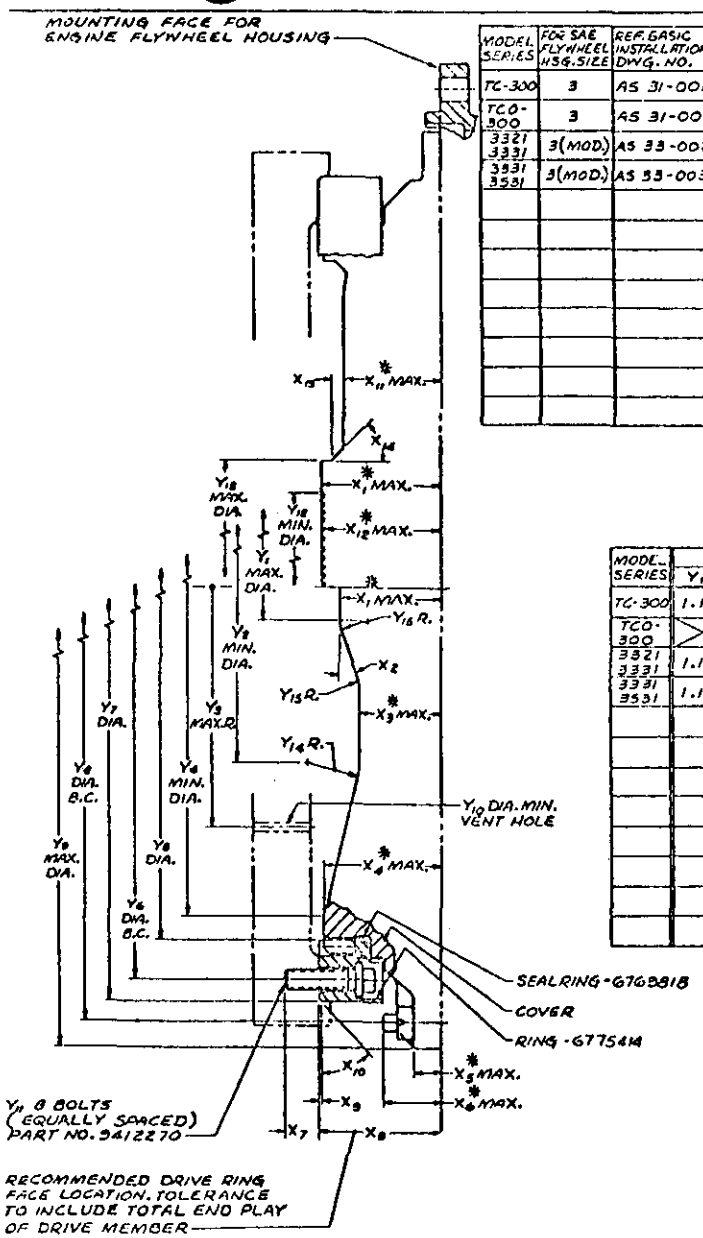
DRAWN	CHECKED	ENGINEER
J. Bigelow 6/3/60	St. John 6/3/60	
SCALE: None	PROJ. ENGR.: St. John 6/6/60	APPL. ENGR.: R.R.R. 6/6/60

TITLE: GREASE SPECIFICATION TC-300 AND CRT-3331 INPUT DRIVE

MODEL

AS-00-006

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



MODEL SERIES	FOR SAE FLYWHEEL HSG. SIZE	REF. BASIC INSTALLATION DWG. NO.	DIMENSIONS														
			X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
TC-300	3	AS 31-001	1.76	20°	1.44	2.04	.514	1.004	.615 / .503	2.125 ±.030	.02 / .04	45°				
TCO-300	3	AS 31-001	2.06			2.05	.275	1.004	.615 / .503	2.125 ±.030	.02 / .04	45°	1.69	2.02	.20	45°
3321 3331	3(MOD.)	AS 33-002	1.77	20°	1.45	2.05	.523	1.014	.615 / .503	2.125 ±.030	.02 / .04	45°				
3931 3531	3(MOD.)	AS 33-003	1.77	20°	1.45	2.05	.524	1.014	.615 / .503	2.125 ±.030	.02 / .04	45°				

MODEL SERIES	DIAMETERS AND RADII														
	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9	Y_{10}	Y_{11}	Y_{12}	Y_{13}	Y_{14}	Y_{15}
TC-300	1.16	5.82	4.00	10.94	11.760 / 11.765	13.125	13.875 / 13.870	14.500	15.46	.125	3/8-16 UNC-3A			.92	.50
TCO-300			4.00	10.99	11.760 / 11.765	13.125	13.875 / 13.870	14.500	15.46	.125	3/8-16 UNC-3A	3.149	4.26		
3321 3331	1.16	5.82	4.00	10.94	11.760 / 11.765	13.125	13.875 / 13.870	14.500	15.46	.125	3/8-16 UNC-3A			.92	.50
3931 3531	1.16	5.82	4.00	10.94	11.760 / 11.765	13.125	13.875 / 13.870	14.500	15.46	.125	3/8-16 UNC-3A			.92	.50

AS 00-007

* DENOTES FUNCTIONAL DIMENSIONS FOR CLEARANCE PROVISION ONLY.

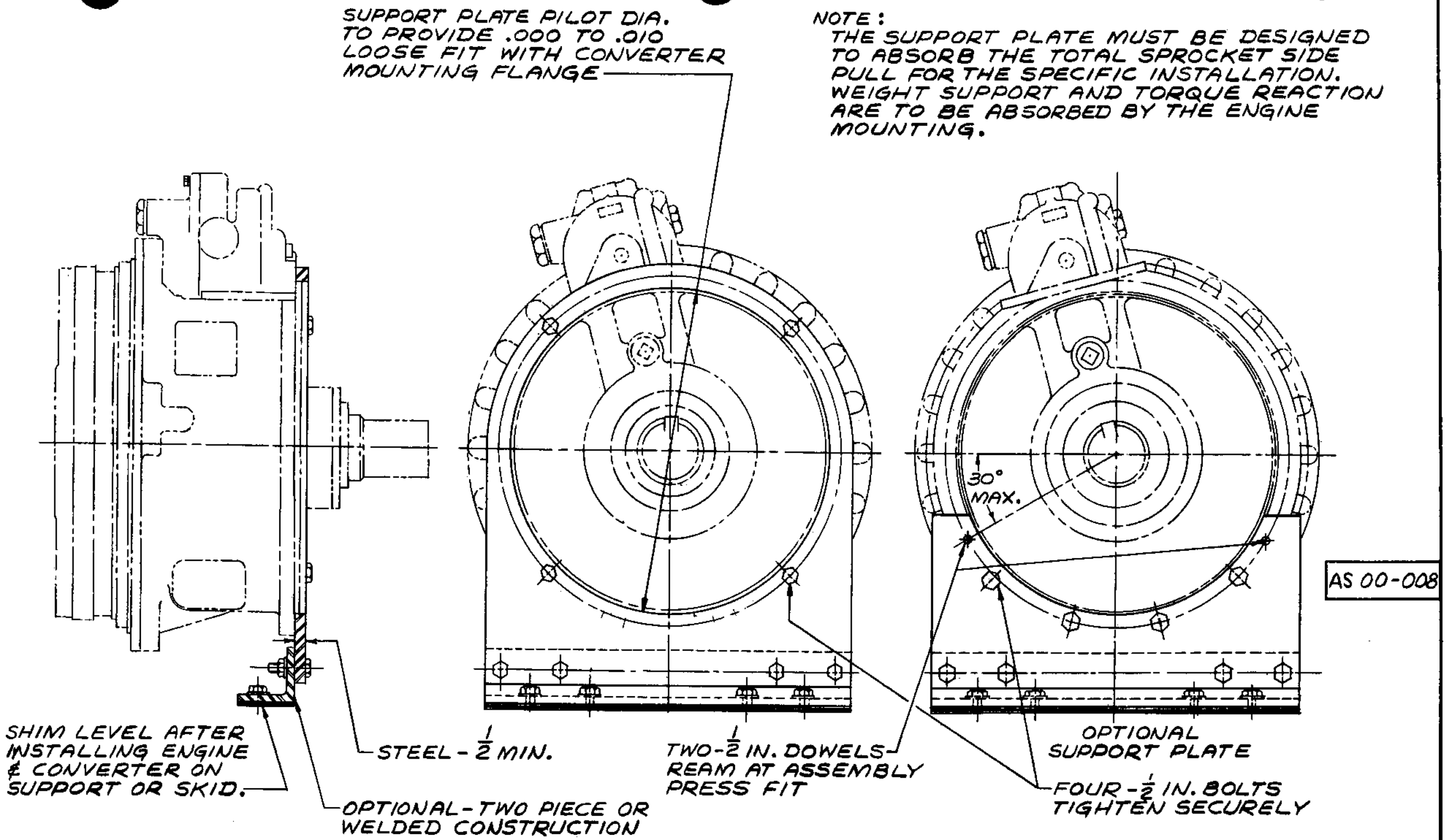
~ INSTALLATION ASSEMBLY INSTRUCTIONS ~
(REF 6775501)

1. PROVIDE Y_{10} VENT HOLE IN DRIVE MEMBER AS SHOWN
2. APPLY PERMATEX NO 3 (675891B) TO THE MATING FACES OF THE ENGINE FLYWHEEL AND DRIVE RING
3. INSTALL DRIVE RING USE 3/8 THINWALL (12 POINT) SOCKET TO TORQUE BOLTS TO 36-43 LB.-FT.
4. ASSEMBLE SEALRING INTO COVER GROOVE APPLY A LIGHT COATING OF GREASE TO SEALRING O.D.
5. DISTRIBUTE ENOUGH WHEEL BEARING GREASE, (REF. AS 00-006), OR EQUIVALENT, EVENLY TO FILL ALL CAVITIES OUTSIDE "Y_5" DIA. INCLUDING SPLINE TOOTH SPACES.
6. COMPLETE INSTALLATION CAREFULLY TO AVOID DAMAGING SEALRING.

Allison TRANSMATIC Drives

PHYSICAL ADAPTATION CHART

SEE CHART | AS 00-007



NOTE:
THE SUPPORT PLATE MUST BE DESIGNED TO ABSORB THE TOTAL SPROCKET SIDE PULL FOR THE SPECIFIC INSTALLATION. WEIGHT SUPPORT AND TORQUE REACTION ARE TO BE ABSORBED BY THE ENGINE MOUNTING.

REFER TO BASIC INSTALLATION DRAWING FOR SPECIFIC CONVERTER DIMENSIONS.

MODEL	DRAWING
TC-400	AS 51-003
TC-500	AS 51-003
TC-800	AS 81-004
TC-900	AS 81-004

CHANGES: J, H, G, F, E, D, C, B, A

Drawn	Checked	Chf. Draftsman
HUGHES 8-29-60	HIGGINS 7-2-62	RTS 7-2-62
Scale: NONE	Proj. Engr.: ST. JOHN 5-8-62	Appl. Engr.: WELCHER 6-1-62

GM GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: RECOMMENDED SUPPORT PLATE CONSTRUCTION

MODEL TC SERIES AS 00-008

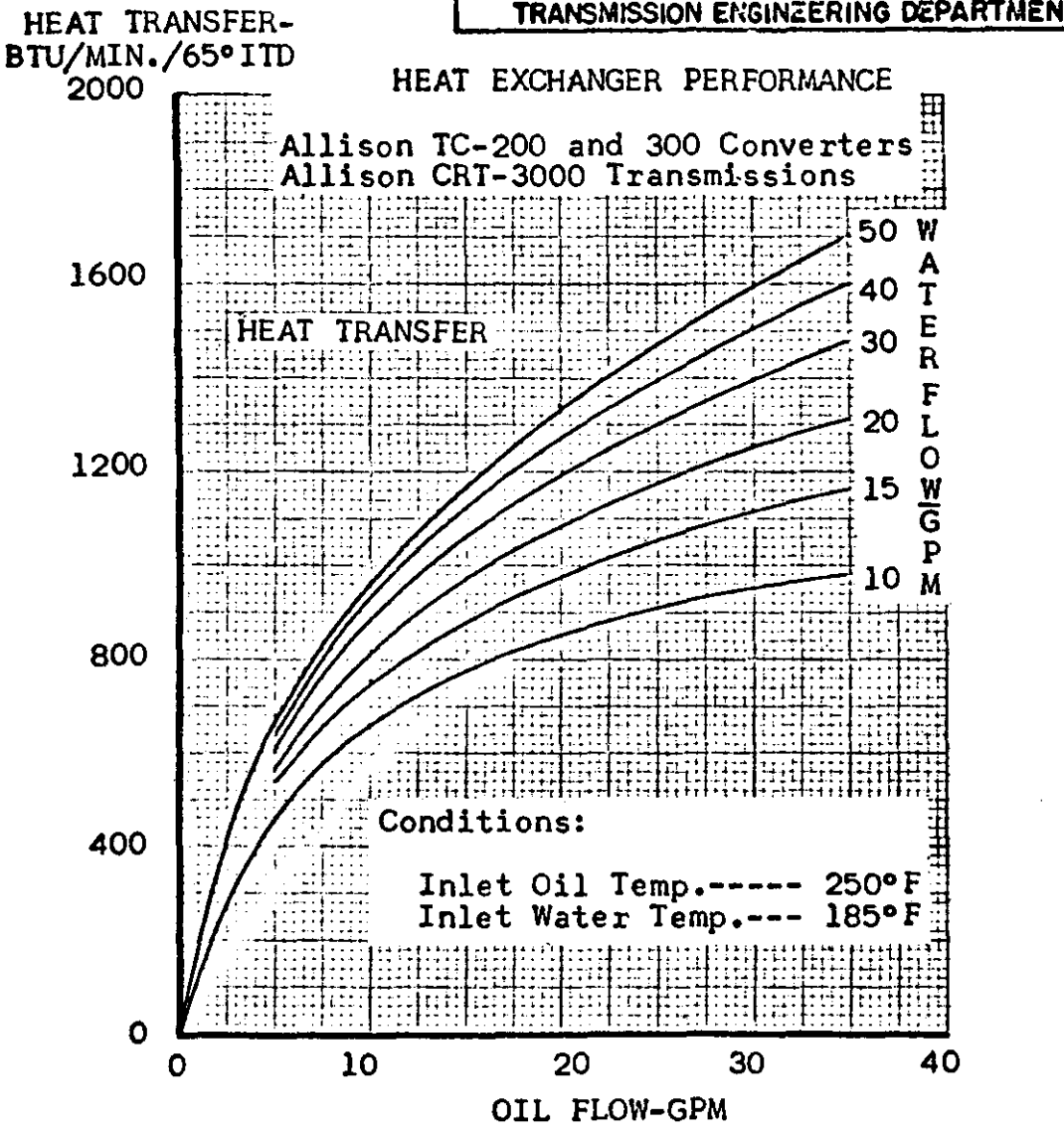
ALLISON DIVISION-GENERAL MOTORS CORPORATION-INDIANAPOLIS, INDIANA

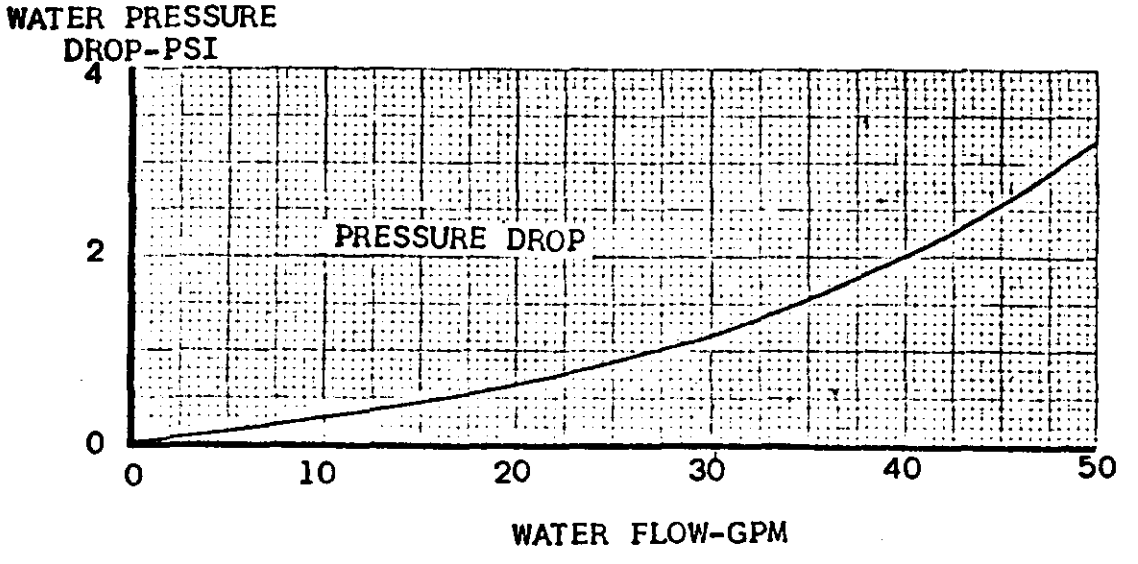
REF. CS 2771

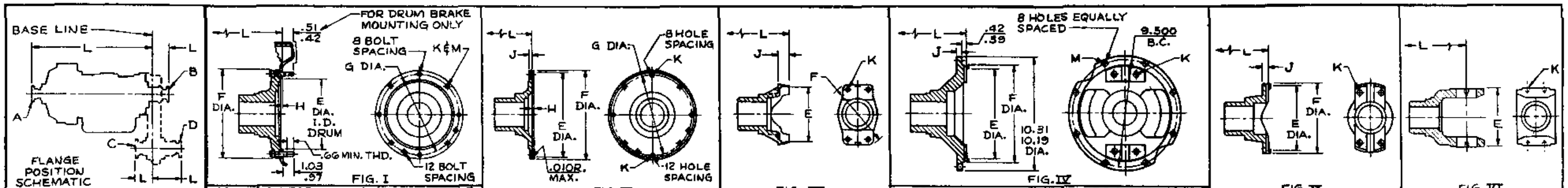
Allison TORQMATIC Drives
INDIANAPOLIS, INDIANA

DATE 5-2-67
BY Ramsey
AS 00-009

TRANSMISSION ENGINEERING DEPARTMENT







POSITION	TYPE	SIZE	FIG. NO.	PART NO.	DETAIL NO.	L DIMENSION FOR MODEL & INSTALLATION REF. DWG. TT, TRT-4000 AS 42-011 AS 42-015	HT-70 AS40 -001	4460 AS44 -001	4460 AS44 -005				E	F	G	H	J	K FOR DRIVE LINE MOUNTING	M FOR PARKING BRAKE DRUM MOUNTING
A	MECH.	7-C	VII	6882139 (NEOPRENE)	6882141	30.82	—	—	—				5.842 5.844	7.87 7.81				3/8-24 THD.-.80 MIN. DEEP 4 HOLES	
A	SPICER	1550	III	6771394	6771393	—	—	40.54	48.34				4.9640 4.9655	5.86			1.041 1.021	.452 .459 DIA.-THRU 4 HOLES	
A	SPICER	1700	II	6771257	6771256	—	—	39.30	47.10				7.750 7.752	8.01 7.99	7.250	.050 .065	.39 .37	.377 .379 DIA.-THRU 8 HOLES	
A	MECH	7-C	V	6771976	6771976	27.77	—	39.80	47.60				5.842 5.844	6.25 6.22			.59 .55	.5212 .5412 DIA.-THRU 4 HOLES	
A	MECH	7-C	VII	6882140 (RUBBER)	6882141	30.82	—	—	—				5.842 5.844	7.87 7.81				3/8-24 THD.-.80 MIN. DEEP 4 HOLES	
A	SPICER	1500	VIII	6777069	6777068	—	—	39.60	47.40				3.750 3.752			.068 .088	.385 .865	.506 .511 DIA.-THRU 4 HOLES	
A	SPICER	1650	III	6770787	6770787	—	—	40.98	48.78				5.5890 5.5905				1.197 1.177	1/2-20 THD.-.69 MIN. DEEP 4 HOLES	

TYPE	SIZE	FIG. NO.	PART NO.	DETAIL NO.	HT-70 AS 40 -001 POS. B	4460 AS44 -001 POS. B	TT, TRT-4000 AS 42-011 AS 42-015 POS. C	TT, TRT-4000 AS 42-011 AS 42-015 POS. D	4460 AS 44-005 POS. C	4460 AS 44-005 POS. D	HT70 AS 40-016 POS. C	HT70 AS 40-016 POS. D	E	F	G	H	J	K FOR DRIVE LINE MOUNTING	M FOR PARKING BRAKE DRUM MOUNTING
MECH	7-C	IV	6778273	6778273	10.29	11.32	—	—	13.46	8.74	—	—	5.844 5.842	8.686 8.684			.62 .50	1/2-20 THD-.85 MIN. DEEP 4 HOLES	1/2-20 THD THRU
MECH	7C	V	6778274	6778274	10.29	11.32	—	—	10.93	*6.20	—	—	5.844 5.842	6.28 6.22				1/2-20 THD-.85 MIN. DEEP 4 HOLES	
MECH	8-C	IV	6771255	6771255	10.29	11.32	—	—	13.46	8.74	—	—	8.123 8.125	8.686 8.684			.62 .50	1/2-20 THD-.85 MIN. DEEP 4 HOLES	1/2-20 THD THRU
MECH	7-C	IV	6839407	6839407			—	15.47			—	—	5.842 5.844	8.686 8.684			.62 .50	1/2-20 THD.-.85 MIN. DEEP 4 HOLES	1/2-20 THD THRU
MECH	7-C	V	6839408	6839408			8.96	15.47			—	—	5.842 5.844	6.28 6.22				1/2-20 THD.-.85 MIN. DEEP 4 HOLES	
MECH	8-C	IV	6839405	6839405			—	15.47			—	—	8.123 8.125	8.686 8.684			.62 .50	1/2-20 THD.-.85 MIN. DEEP 4 HOLES	1/2-20 THD THRU
MECH	8-C	V	6838787	6838787			8.96	15.47			—	—	8.123 8.125	8.53 8.41			.74 .70	1/2-20 THD.-.85 MIN. DEEP 4 HOLES	
MECH	9-C	V	6839942	6839942			8.96	15.47			—	—	8.249 8.251	8.65 8.59			.74 .70	1/2-20 THD.-THRU 4 HOLES	
SPICER	1700	I	6771285	6771284	9.11	10.14	...	--	12.29	7.56	—	—	6.436 6.438	8.01 7.99	7.250	.145 .175		3/8-24 THD. 8 BOLTS	3/8-24 THD. 8 BOLTS
SPICER	1700	II									—	—	7.750 7.752	8.01 7.99	7.250	.050 .065	.51 .49	.377 .379 DIA.-THRU 8 HOLES	
SPICER	1800	I	6771519	6771518	9.11	10.14	—	—	12.29	7.56	—	—	6.436 6.438	8.01 7.99	7.250	.145 .175		7/16-20 THD. 12 BOLTS	7/16-20 THD. 12 BOLTS
SPICER	1800	II	6839406	6839406			7.78	14.30			—	—	7.750 7.752	8.01 7.99	7.250	.050 .065	.51 .49	.439 .441 DIA-THRU 12 HOLES	
ROCK	7-N	IX	6838781	6838781	—	—	—	17.42			—	—	5.936 5.938	8.684 8.686				5/16-24 THD.-.38 MIN. DEEP 2 HOLES	1/2-20 THD. THRU 8 BOLTS
ROCK	7-N	VI	6838780	6838780	—	—	9.74	—			—	—	5.936 5.938					5/16-24 THD.-.38 MIN. DEEP 4 HOLES	
BRAKE ONLY	—	I	6771875	6771284	—	—	—	—	12.29	7.56	—	—	6.436 6.438	8.01 7.99	7.250	.145 .175		NONE	3/8-24 THD. 8 BOLTS
MECH	7-C	V	6773820	6773820	—	—	—	—	—	—	17.91	—	5.844 5.842	6.23 6.21			.59 .53	1/2-20 THD.-THRU 4 HOLES	
MECH	7-C	IV	6773822	6773822	—	—	—	—	—	—	—	8.51	5.844 5.842	6.436 6.434			.73 .63	1/2-20 THD.-.85 MIN DEEP 4 HOLES	7/16-20 THD 12 BOLTS
MECH	9-C	IV	6838716	6838716	—	—	—	15.67	—	—	—	—	8.251 8.249	8.686 8.684			.57 .55	1/2-20 THD.-THRU 4 HOLES	1/2-20 THD.-THRU 8 BOLTS
MECH	8-C	V	6771573	6771573	10.29	11.32	—	—	10.93	*6.20	—	—	8.123 8.125	8.53 8.41			.74 .70	1/2-20 THD.-.85 MIN. DEEP 4 HOLES	
MECH	9-C	V	6777400	6777400	10.29	11.32	—	—	10.93	*6.20	—	—	8.249 8.251	8.65 8.59			.74 .70	1/2-20 THD.-THRU 4 HOLES	
SPICER	1800	II	6771538	6771538	9.11	10.14	—	—	9.75	*5.02	—	—	7.750 7.752	8.01 7.99	7.250	.050 .065	.51 .49	.439 .441 DIA. THRU 12 HOLES	
ROCK	7-N	IX	6778950	6778950	—	—	—	17.42	15.42	10.69	—	—	5.936 5.938	8.684 8.686				5/16-24 THD.-.38 MIN. DEEP 2 HOLES	1/2-20 THD THRU 8 BOLTS
ROCK	7-N	VI	6778949	6778949	—	—	—	—	11.71	*6.98	—	—	5.936 5.938					5/16-24 THD.-.38 MIN. DEEP 4 HOLES	

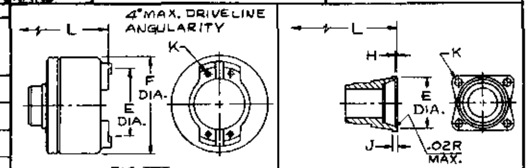


FIG. VII
TORQMATIC COUPLING

FIG. VIII

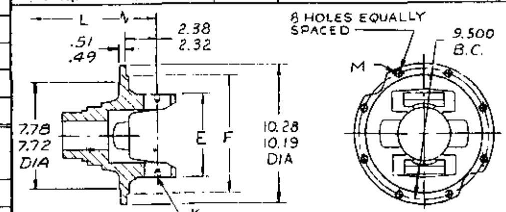


FIG. IX

AS 00-011

* ADD 2.54 IF BOTH C AND D OUTPUTS ARE USED WITH NO PARKING BRAKE

AA	1-4-82	IN FIG. VII 4° WAS 5°		
Y	7-15-80	REM DATA SPICER II TT, TRT, HT 70, 4460		
W	2-15-83	DELETED 6771555		
V	2-15-80	6771976 WAS 6771...		
U	10-29-76	REV CHART NUMBERS		
T	4-17-75	ADDED 27.77 TO AS 42-011		
S	1-1-74	ADDED 8 NEW FLANGES		
R	1-18-74	ADDED NEW PART NOS		
P	3-14-73	FIG VII & PARTS REV		
N	11-29-72	SEE CHG NOTICE		
M	5-24-72	SEE CHG NOTICE		
L	10-30-67	SEE CHG NOTICE		
K	7-17-67	ADD NOTE AND ASTERISK		
J	4-26-66	REVISED	KS	
H	6-22-65	SEE CHG NOTICE		

HUGHES 3-8-61 | B.W.K. 4-11-61 | 4-12-61 | SCALE NONE | EPW PBP 4-13-61

Allison Torqmatic Drive

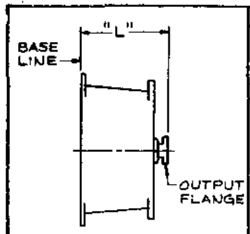
TITLE: DRIVE FLANGE OPTION

MODEL SEE CHART | AS 00-011

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA

29½ 06

FLANGE DELINEATION CHART



SCHEMATIC

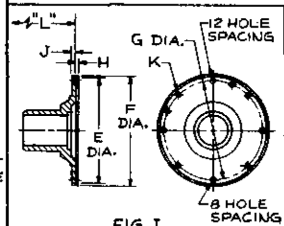


FIG. I

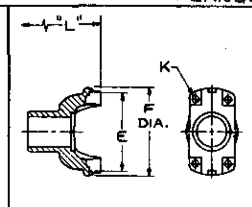


FIG. II

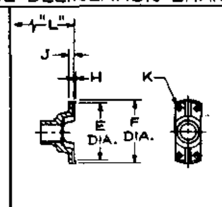


FIG. III

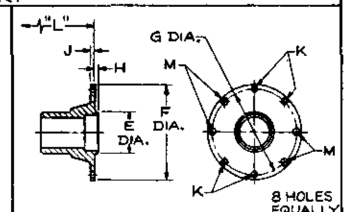


FIG. IV

FLANGE					"L" DIMENSION FOR MODEL & BASIC INSTALLATION					FLANGE DETAIL DIMENSIONS						
TYPE	SIZE	FIG. NO.	PART NO.	DETAIL NO.	TC-200 (AS 31-001)	TC-300 (AS 31-001)	TC-400 & 500 (AS 51-003)	TCB-500 OPTION (AS 51-006)	TC-800 & 900 (AS 81-002)	E	F	G	H	J	FOR DRIVE LINE MOUNTING: K	FOR DRIVE LINE MOUNTING: M
MECH.	4-C	III	6754963	6754967	9.90					4.249 4.251	4.51 4.49		.13 .11	.41 .39	.334 .354 DIA.-THRU 4 HOLES	
MECH.	4-C	III	6755333	6754034		9.90				4.249 4.251	4.51 4.49		.13 .11	.41 .39	.334 .354 DIA.-THRU 4 HOLES	
MECH.	7-C	III	6750413	6750413			12.99	18.02		5.842 5.844	6.25 6.19		.21 .17	.59 .55	.459 .479 DIA.-THRU 4 HOLES	
SPICER	1650	II	6770789	6770789			14.34			5.5875 5.5890	6.44				½-20 THD.-.75 DEEP 4 HOLES	
SPICER	1700	I	6752247	6752247			12.99	18.02		7.750 7.752	8.01 7.99	7.250	.050 .060	.40 .36	.377 .379 DIA. 8 HOLES EQUALLY SPACED	
SPICER	1800	I	6769127	6769127			12.99	18.02		7.750 7.752	8.01 7.99	7.250	.050 .060	.40 .36	.439 .441 DIA. 12 HOLES	
AL-METAL	—	IV	6750544	6750544			12.99			2.998 2.996	6.885 6.865	6.125	.197 .177	.385 .365	.396 .416 DIA.-THRU 4 HOLES	.4995 .5005 DIA.-THRU 4 HOLES
MECH.	7-C	III	6752933	6752933					16.30	5.842 5.844	6.25 6.19		.20 .18	.550 .530	½-20 THD.-THRU 4 HOLES	
SPICER	1700	I	6754103	6754103					17.30	7.750 7.752	8.01 7.99	7.250	.050 .060	.390 .370	.377 .379 DIA. 8 HOLES EQUALLY SPACED	
SPICER	1800	I	6752520	6752520					17.30	7.750 7.752	8.01 7.99	7.250	.050 .060	.390 .370	.439 .441 DIA. 12 HOLES	

AS 00-012

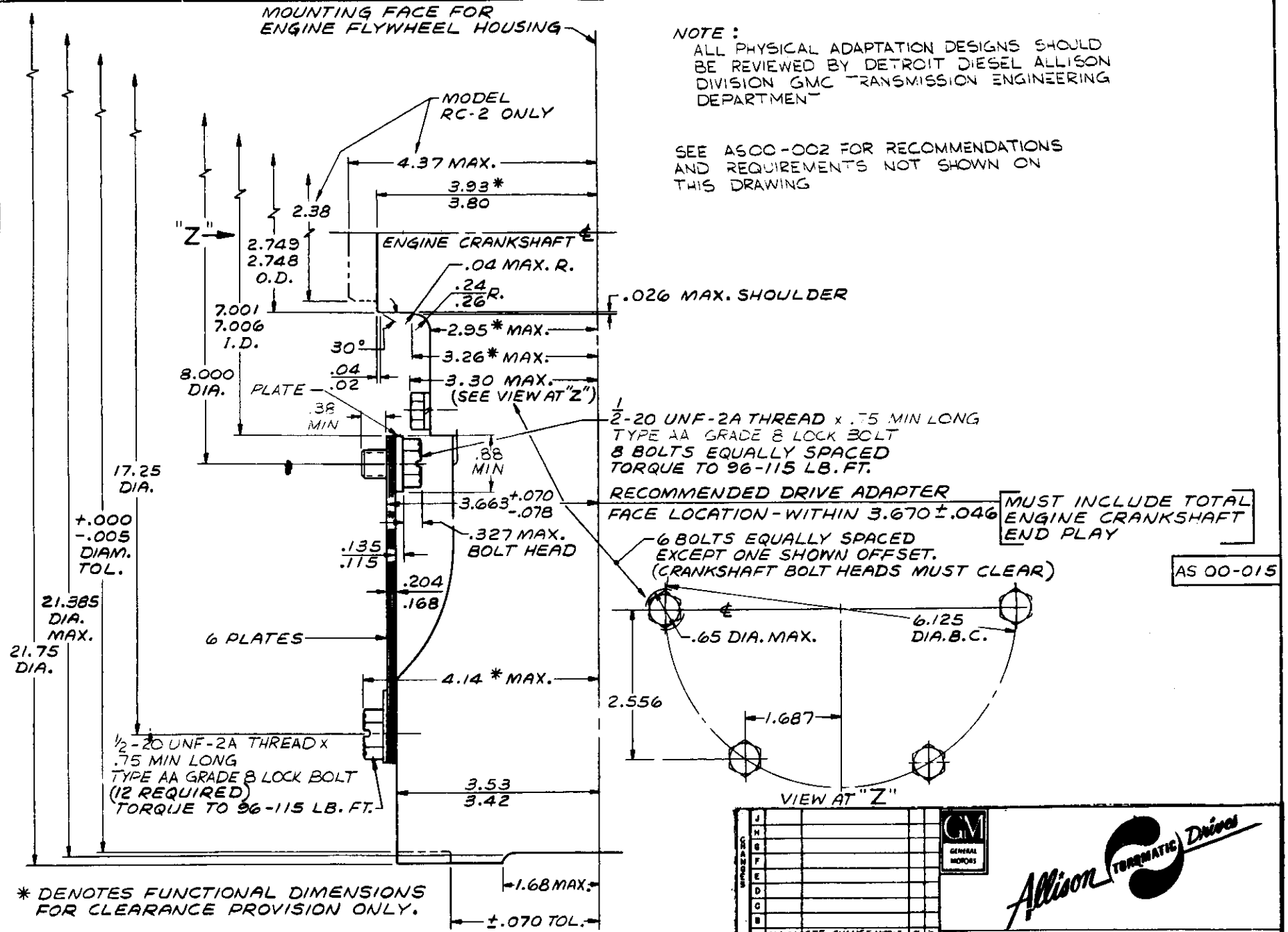
Allison (Torqmatic) Drives

TITLE: OUTPUT FLANGE OPT[illegible]

MODEL: SEE CHART

AS 00[illegible]

HUGHES 8-4-61 · SWEANY 6-20-61 · KTS 8-24-61 · DEAL 8-11-61 · ST. JOHN 8-11-61 · NONE



NOTE:
ALL PHYSICAL ADAPTATION DESIGNS SHOULD BE REVIEWED BY DETROIT DIESEL ALLISON DIVISION GMC TRANSMISSION ENGINEERING DEPARTMENT

SEE AS00-002 FOR RECOMMENDATIONS AND REQUIREMENTS NOT SHOWN ON THIS DRAWING

* DENOTES FUNCTIONAL DIMENSIONS FOR CLEARANCE PROVISION ONLY.

A	06JA64	SEE CHANGE NOTICE	

DRAWN 8-21-63	CHECKED HIGGINS 3-15-62	APP. ENGR. PTS 5-16-62
SCALE FULL	PROJ. ENGR. ST. JOHN 8-7-62	APPL. ENGR. SOWHAM 8-7-62

GM GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: PHYSICAL ADAPTATION CHART

MODEL TC-800 & 900 - RC-2

AS 00-015

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA

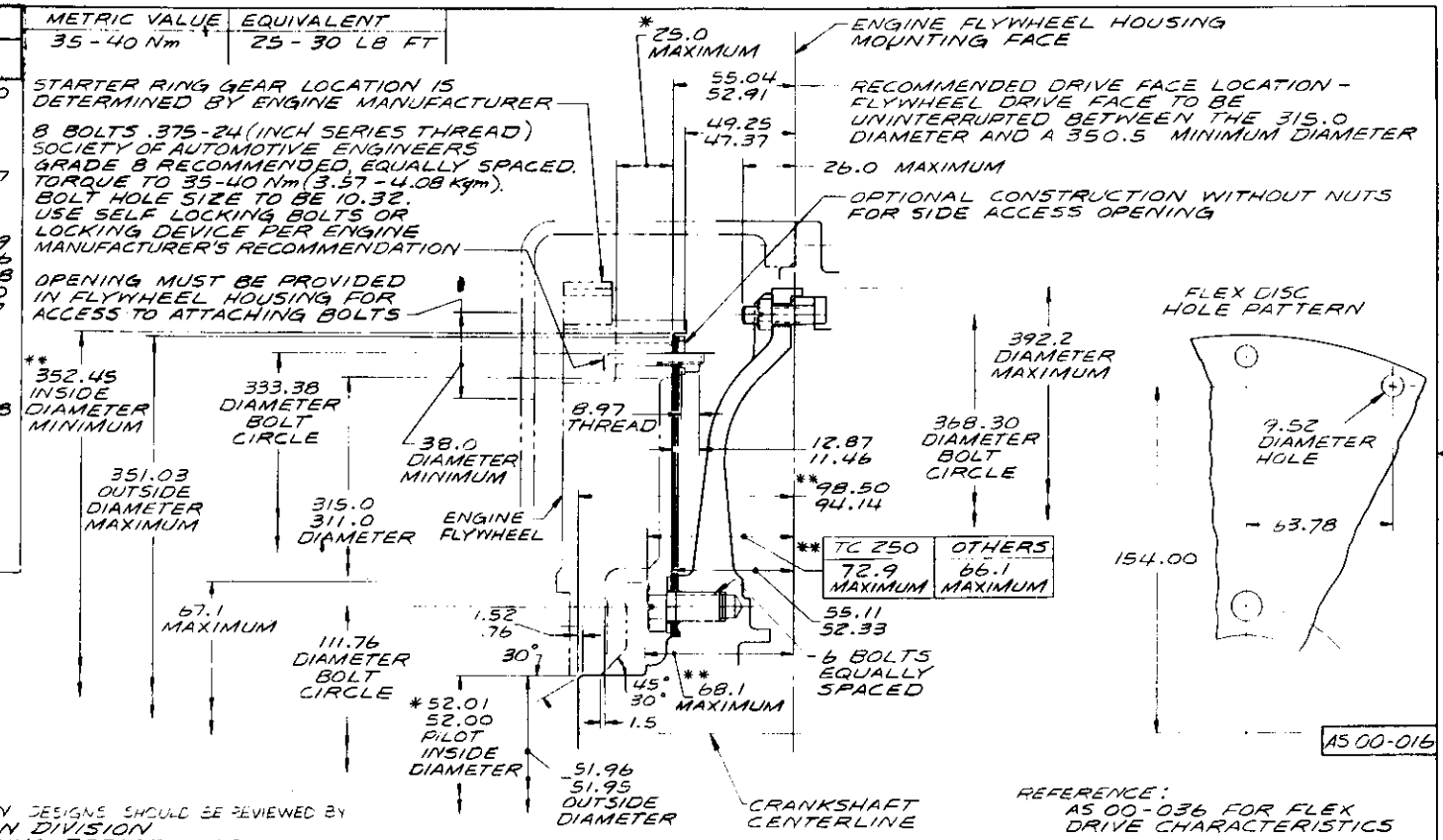
MILLIMETRES TO INCHES			
mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
.76	1.52	.030	.060
1.5		.06	
8.97		.353	
9.52		.375	
10.31		.406	
11.46	12.87	.451	.507
25.0		1.00	
26.0		1.02	
38.0		1.50	
47.37	49.25	1.865	1.939
51.95	51.96	2.045	2.046
52.00	52.01	2.047	2.048
52.33	55.11	2.060	2.170
52.91	55.04	2.083	2.167
63.78		2.511	
66.1		2.60	
67.1		2.64	
68.1		2.68	
72.9		2.87	
94.14	98.50	3.706	3.878
111.76		4.400	
154.00		6.063	
311.0	315.0	12.25	12.40
333.38		13.125	
350.5		13.80	
351.03		13.820	
352.45		13.876	
368.30		14.500	
392.2		15.44	

METRIC VALUE	EQUIVALENT
35 - 40 Nm	25 - 30 LB FT

STARTER RING GEAR LOCATION IS DETERMINED BY ENGINE MANUFACTURER

8 BOLTS .375-24 (INCH SERIES THREAD) SOCIETY OF AUTOMOTIVE ENGINEERS GRADE 8 RECOMMENDED, EQUALLY SPACED. TORQUE TO 35-40 Nm (3.57 - 4.08 Kgm). BOLT HOLE SIZE TO BE 10.32. USE SELF LOCKING BOLTS OR LOCKING DEVICE PER ENGINE MANUFACTURER'S RECOMMENDATION

OPENING MUST BE PROVIDED IN FLYWHEEL HOUSING FOR ACCESS TO ATTACHING BOLTS



REFERENCE: AS 00-036 FOR FLEX DRIVE CHARACTERISTICS

ALL PHYSICAL ADAPTATION DESIGNS SHOULD BE REVIEWED BY DETROIT DIESEL ALLISON DIVISION TRANSMISSION ENGINEERING DEPARTMENT

* DENOTES RECOMMENDED DIMENSION

** DENOTES FUNCTIONAL DIMENSIONS FOR CLEARANCE PROVISION ONLY.

ENGINE FLYWHEEL HOUSING AND FLYWHEEL PILOT DIAMETERS MUST MEET SOCIETY OF AUTOMOTIVE ENGINEERS J 617 HOUSING NUMBER 3 AND J 927 FLYWHEEL NUMBER 60 CONCENTRICITY REQUIREMENTS

FOR MODELS
TT - 2000
TRT - 2000
TT - 3000
CRT - 3000
TC - 250
TC - 300

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

HUGHES 5-2-62	SCEANY 5-2-62	ATS 5-2-62	
FULL	MILLER 5-2-62	ST JOHN 5-2-62	

Allison Transmissions

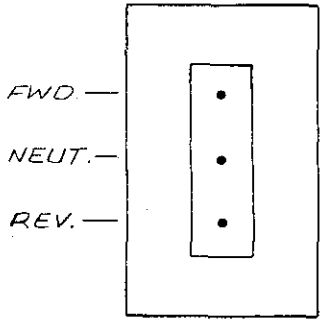
FLEX PLATE INPUT DRIVE DATA

MODEL SEE NOTE | AS 00-016

Detroit Diesel Allison Division of General Motors Indianapolis, Indiana

FORM 8207 S

RECOMMENDED GATING PATTERNS:



MODEL TRT-2211-3
TRT-2411-3

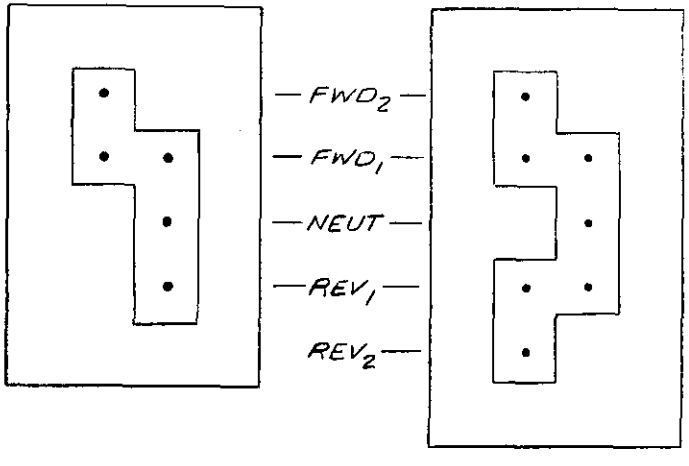
CONTROL TOWER MOUNTING MUST BE DESIGNED FOR MINIMUM RELATIVE MOVEMENT WITH TRANSMISSION. MOUNTING TO FRAME OR CROSS MEMBER IS RECOMMENDED WHERE FEASIBLE.

CONTROL TOWER & LINKAGE MUST BE DESIGNED TO ALLOW 10 TO 15% OVER TRAVEL, EACH POSITION OF SHIFT CONTROL LEVER, TO PERMIT TRANSMISSION SHIFT VALVE DETENT TO POSITION LEVER WITHOUT EXTERNAL INTERFERENCE OR BINDING.

FOR REQUIRED SHIFT FORCE AND STROKE SPECIFICATIONS, REFER TO BASIC TRANSMISSION INSTALLATION DRAWING.

VEHICLE MANUFACTURERS TOWER DESIGN SHOULD BE CORRELATED WITH ALLISON TRANSMISSION ENGINEERING.

AS 00-026



MODEL TT-2221-1 & 3
TT-2421-1 & 3
TT-4721-1
TT-3420-1

MODEL TRT-2221-1 & 3
TRT-2421-1 & 3
TRT-4821-1
TRT-3220-1
TRT-3420-1

CHANGES				
E	3/20/75	ADDED TT-3420-1 AND REMOVED 1000 SERIES		
D	11/27/73	ADD SHIFT PATTERNS TT-2000 & 4000		
C	10-12-67	SEE REV NOTICE	JG	
B	2-22-65	WAS TT-1120-1		
A	2-10-65	ADDED TT-4420-1		

GM GENERAL MOTORS

Allison TORQMATIC Drives

DRAWN	CHECKED	CHF. DRAFTSMAN
HUGHES 8-13-64	HIGGINS 8-24-64	R.T.S. 8-24-64
SCALE NONE	PROJ. ENGR. MILLER 8-13-64	APPL. ENGR. WELCHER 8-13-64

TITLE: SHIFT TOWER GATING PATTERNS

MODEL SEE NOTE | AS 00-026

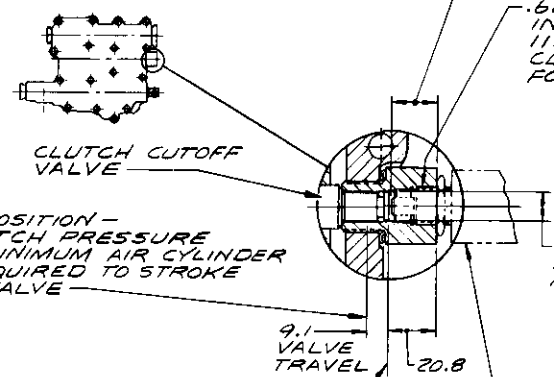
ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA

FORM 10-16-C REV. 8-68

MILLIMETRES TO INCHES			
mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
9.1 11.1 12.68 17.3 20.8	20.0	.36 .44 .4995 .68 .82	.79

METRIC VALUE	EQUIVALENT
66.0 N	15 POUNDS
111.0 N	25 POUNDS

MODEL SERIES	BASIC INSTALLATION DRAWING
TT 2000 AND TRT 2000	AS 22-003 AS 22-021
TT 3000	AS 32-001
TT 4000 AND TRT 4000	AS 42-015



WITH PUSH ROD IN RETRACTED POSITION, A DIMENSION OF 17.3 - 20.0 FROM END OF PUSH ROD TO LOCKNUT OR FACE OF CYLINDER MUST BE MAINTAINED AT INSTALLATION OF CYLINDER
.625-18 UNF-2B INCH SERIES THREAD 11.1 MINIMUM FULL THREAD CLUTCH CUTOFF VALVE CONNECTION FOR AIR CYLINDER
CLUTCH CUTOFF VALVE
CUTOFF POSITION — ZERO CLUTCH PRESSURE 111.0 N MINIMUM AIR CYLINDER FORCE REQUIRED TO STROKE CUTOFF VALVE
12.68 DIAMETER MINIMUM
9.1 VALVE TRAVEL
20.8
CLUTCH ENGAGED POSITION — FULL CLUTCH PRESSURE 66.0 N MINIMUM RETURN FORCE AVAILABLE FROM CUTOFF VALVE
AIR MITE DEVICES MICRO MODEL V-100 OR EQUIVALENT AIR CYLINDER

SECTION VIEW OF CUTOFF VALVE PLUG
SCALE : FULL

AS 00-027

NOTE :

1 AIR MUST NOT BE INTRODUCED INTO VALVE BODY

2 AIR CYLINDER TO ACTUATE VALVE BY MEANS OF PUSH ROD AND PROVIDE POSITIVE RETURN FORCE

3 TRANSMISSION ENGINEERING DEPARTMENT'S REVIEW IS REQUESTED PRIOR TO USE OF ACTUATING MECHANISM

FOR TRANSMISSION INSTALLATION DATA NOT SHOWN SEE BASIC INSTALLATION DRAWING

PARTS SHOWN IN PHANTOM ARE TO BE FURNISHED BY CUSTOMER

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

CHANGES				
D	09MAR84	(1) REV REVIEW NOTE (2) NAS AS42-011		
C	3-20-73	REVISED TO METRIC		HH

DRAWN	CHECKED	CHF DRAFTSMAN
SWEANY 8-25-64	HARPER 9-1-64	RTS 9-1-64

SCALE	PROJ ENGR	APPL ENGR
0.2 TIMES	D MUELLER 8-25-64	E P WELCHER 8-25-64

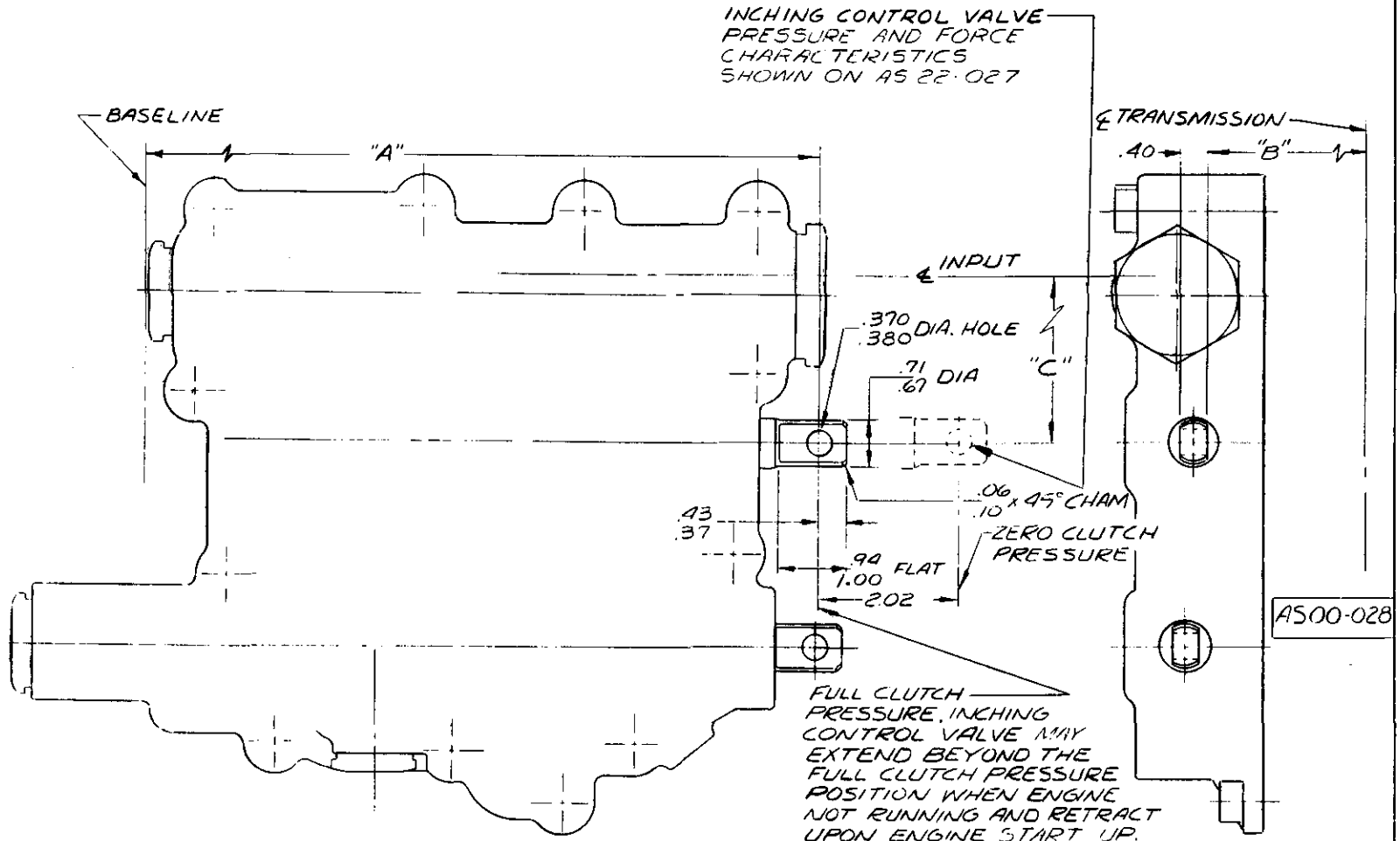
Allison Transmissions

TITLE AIR ACTUATED CLUTCH CUTOFF OPTION

MODEL SEE CHART AS 00-027

Detroit Diesel Allison Division of General Motors - Indianapolis, Indiana

FORM 8202-S



OPTIONAL INCHING CONTROL VALVE
(FOR ALL TRANSMISSION INSTALLATION DATA NOT SHOWN SEE BASIC INSTALLATION TRAINING)

MODEL SERIES	BASIC INST DRAWING	"A" DIM.	"B" DIM.	"C" DIM.
TT & TRT 2000	AS 22-012 AS 22-021	9.70	9.05	2.40
TT & TRT 3000	AS 32-011 AS 32-006	9.76	9.05	2.40
TT & TRT-4000	AS 42-011	.35	10.44	4.40

CHANGES			
J			
H			
G			
F	11-1-79	[illegible]	[illegible]
E	5-24-73	REDRAWN WITH REVISED DIM "B"	
D		VALVE BODY CONFIG ONLY	
C			
B			
A			

DRAWN	CHECKED	ENG. APPROVAL
HUGHES 9-10-64	COL 9-24-64	ETS 9-25-64
SCALE FULL	PROJ. ENGR. DFM 9-10-64	APPL. ENGR. EPN 9-10-64

Allison Transmissions

TITLE: INCHING CONTROL VALVE BODY

MODEL SEE CHART | AS00-028

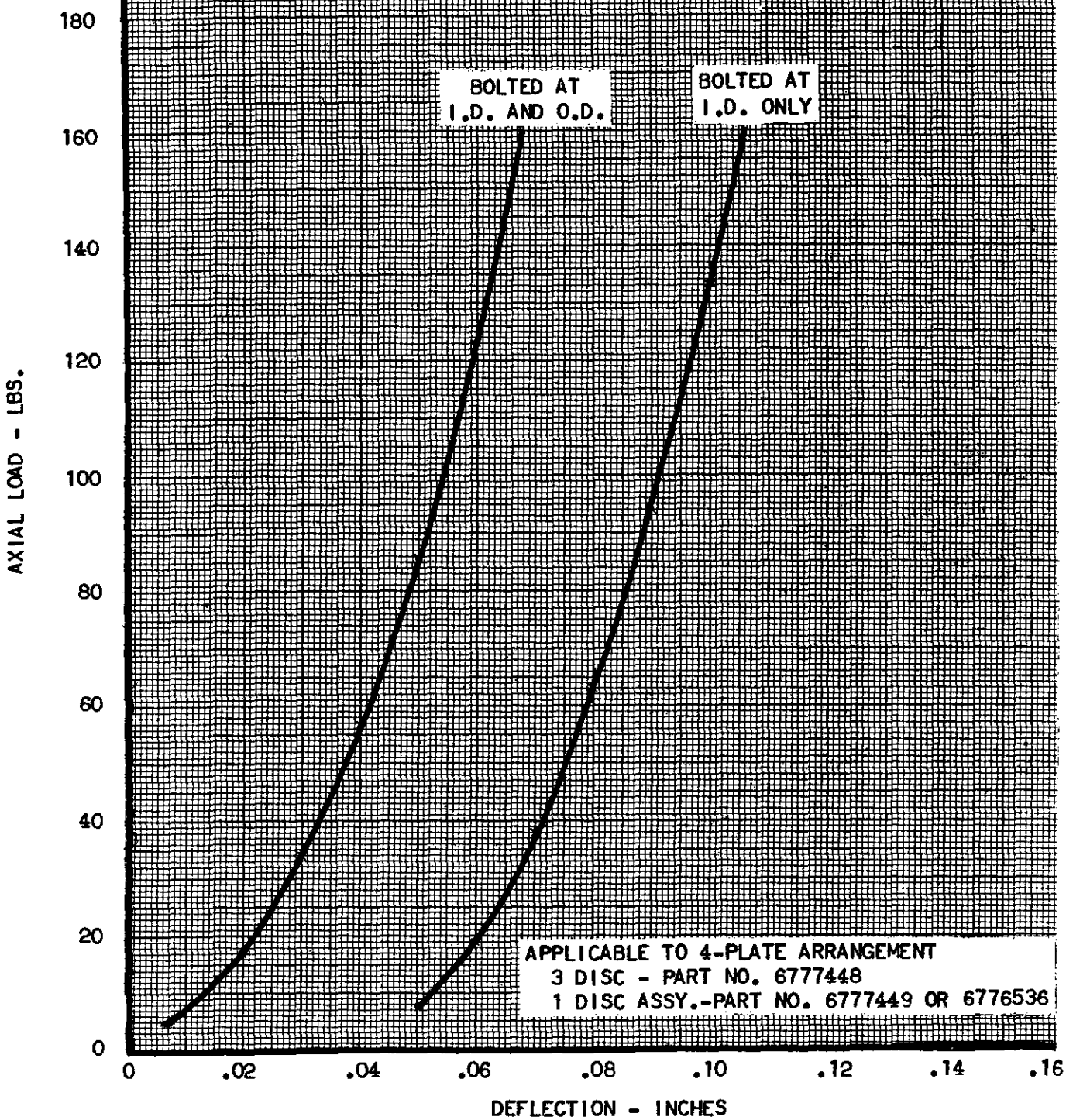
Detroit Diesel Allison Division of General Motors · Indianapolis, Indiana

Allison TORQMATIC Drives
INDIANAPOLIS, INDIANA

DATE 6-5-69
BY RAMSEY
AS-00-036

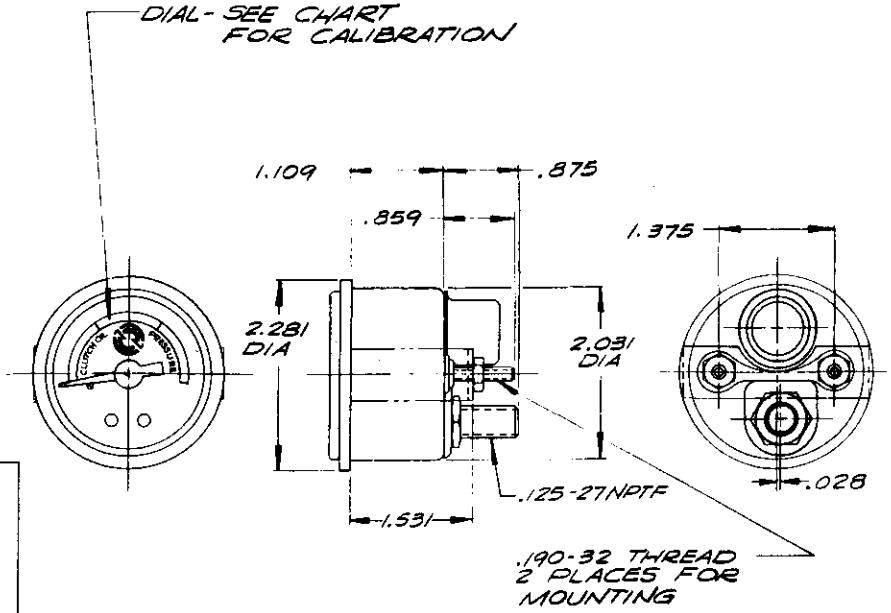
TRANSMISSION ENGINEERING DEPARTMENT

FLEX DRIVE CHARACTERISTICS
FOR
ALLISON TT & TRT-2000 AND CRT-3000 SERIES TRANSMISSIONS AND TC-250 & TC-300 SERIES INDUSTRIAL CONVERTERS



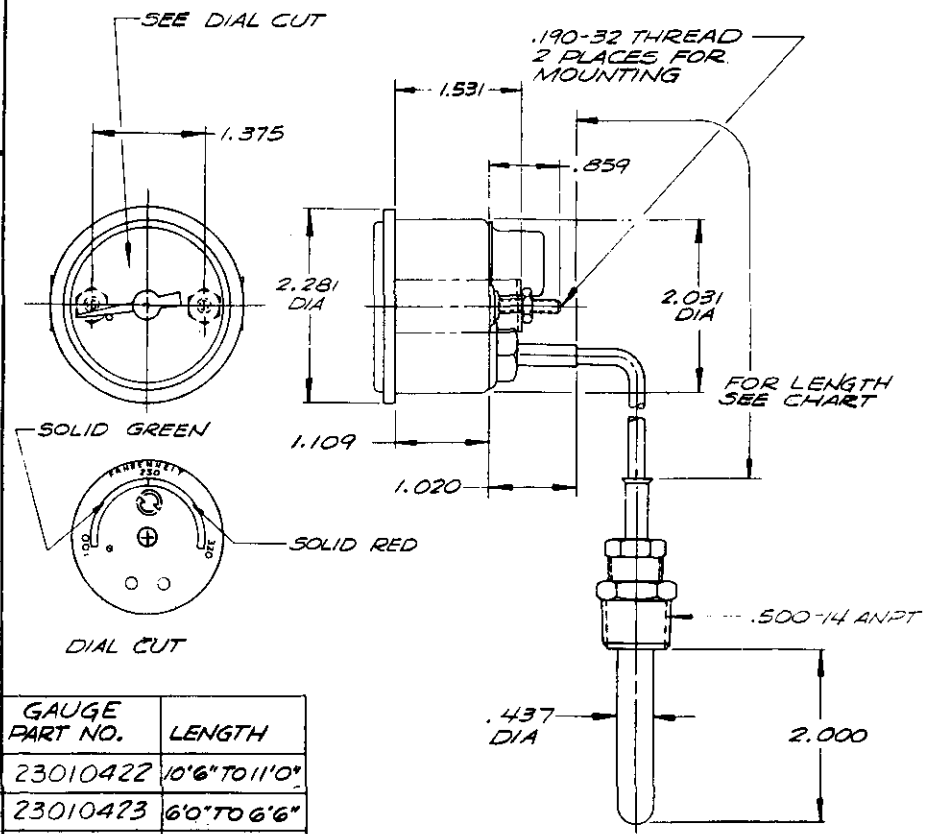
APPLICABLE TO 4-PLATE ARRANGEMENT
3 DISC - PART NO. 6777448
1 DISC ASSY.-PART NO. 6777449 OR 6776536

GAUGE PART NO.	TRANSMISSION MODEL	MAIN PRESSURE, RANGE CALIBRATIONS - PSI
6838450	TG-600, CLBT 754 CRT-3531	0 RED 140 GREEN 185 RED 250
6838451	CRT-5000 CRT-3321, 31	0 RED 110 GREEN 150 RED 200
6838452	CT, CLT, CLBT, VCLBT-4000	0 RED 100 WHITE 175 GREEN 200 280 RED 300
6838453	CT, CLT, VCLT-3000	0 RED 90 WHITE 135 GREEN 190 210 260 RED 300
6838454	CT, CLT, CLBT, VCLBT-5, 6000, TT, TRT-4000	0 RED 160 GREEN 220 RED 300
6838455	DP-8000, CLBT 9000	0 RED 140 GREEN 190 250 RED 300
6838456	TT, TRT-2000 TT-3000	0 RED 130 GREEN 195 RED 250



OIL PRESSURE GAUGE

A500-045



DIAL CUT

OIL TEMPERATURE GAUGE

GAUGE PART NO.	LENGTH
23010422	10'6" TO 11'0"
23010423	6'0" TO 6'6"
23010424	4'0" TO 4'6"

CHANGES			
J			
H			
G			
F			
E			
D			
C			
B	8 AUG 73	REVISED CHARTS	
A	4-4-75	ADDED TT-3000	

Allison Transmissions

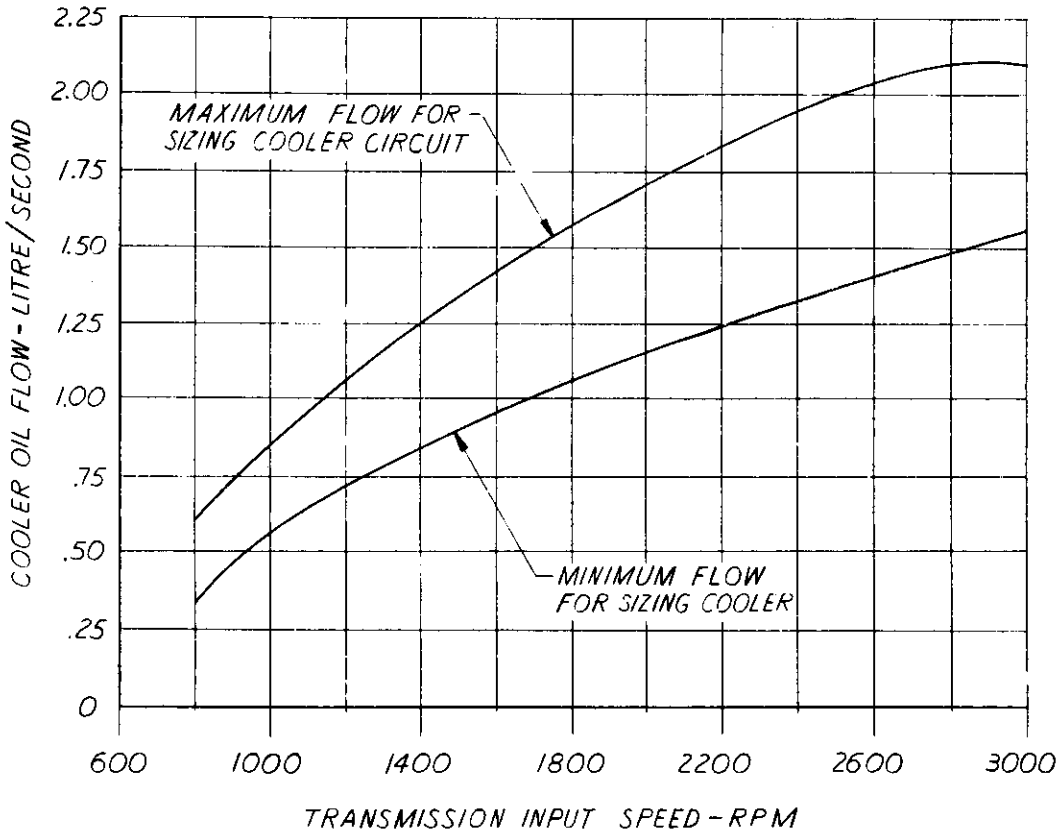
TITLE: OFF-HIGHWAY TRANSMISSION GAUGES

MODEL SEE CHART | AS 00-045

Detroit Diesel Allison Division of General Motors · Indianapolis, Indiana

M. MOORE 7-28-71	J.D. [illegible] 7-28-71	[illegible] 7-31-71
SCALE FULL	PROJ. ENGR. J. S. DAKER 7-3-71	APPL. ENGR. M.R. [illegible] 7-28-71

COOLER CIRCUIT OIL FLOW DATA
C-3 TRANSMISSION FLUID AT 93° C



THIS DATA APPLIES TO THE FOLLOWING TRANSMISSION MODELS:

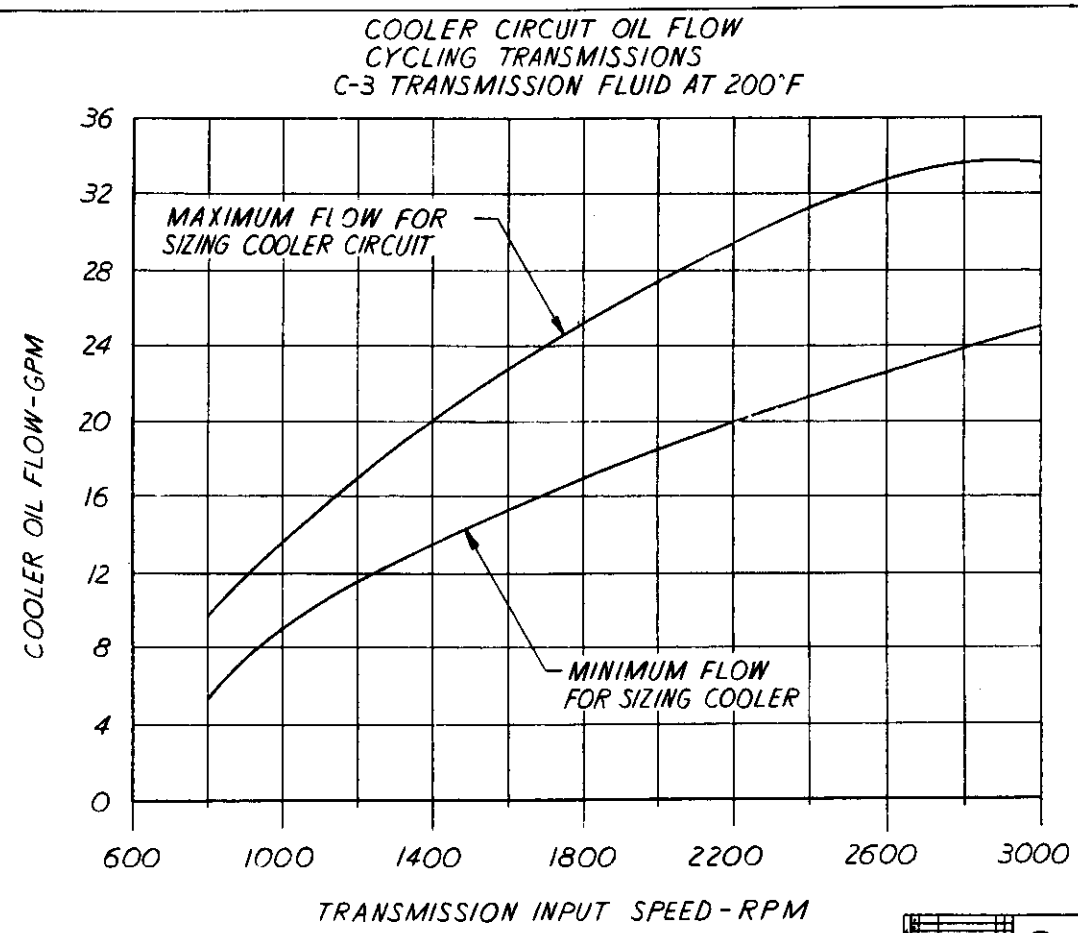
TT/TRT 2000 SERIES
TTB 2000 *
TT/TRT 3000 SERIES
TT/TRT 4000 SERIES
CRT 5643

* COOLER FLOW WILL BE .126 ℓ/s LESS WITH INTERNAL BRAKE

COOLER CIRCUIT PRESSURE DROP (INCLUDING COOLER LINES) WITH FLOW AT MAXIMUM INPUT SPEED TO BE 276 KPa (2.81 Kg/cm²) MAX

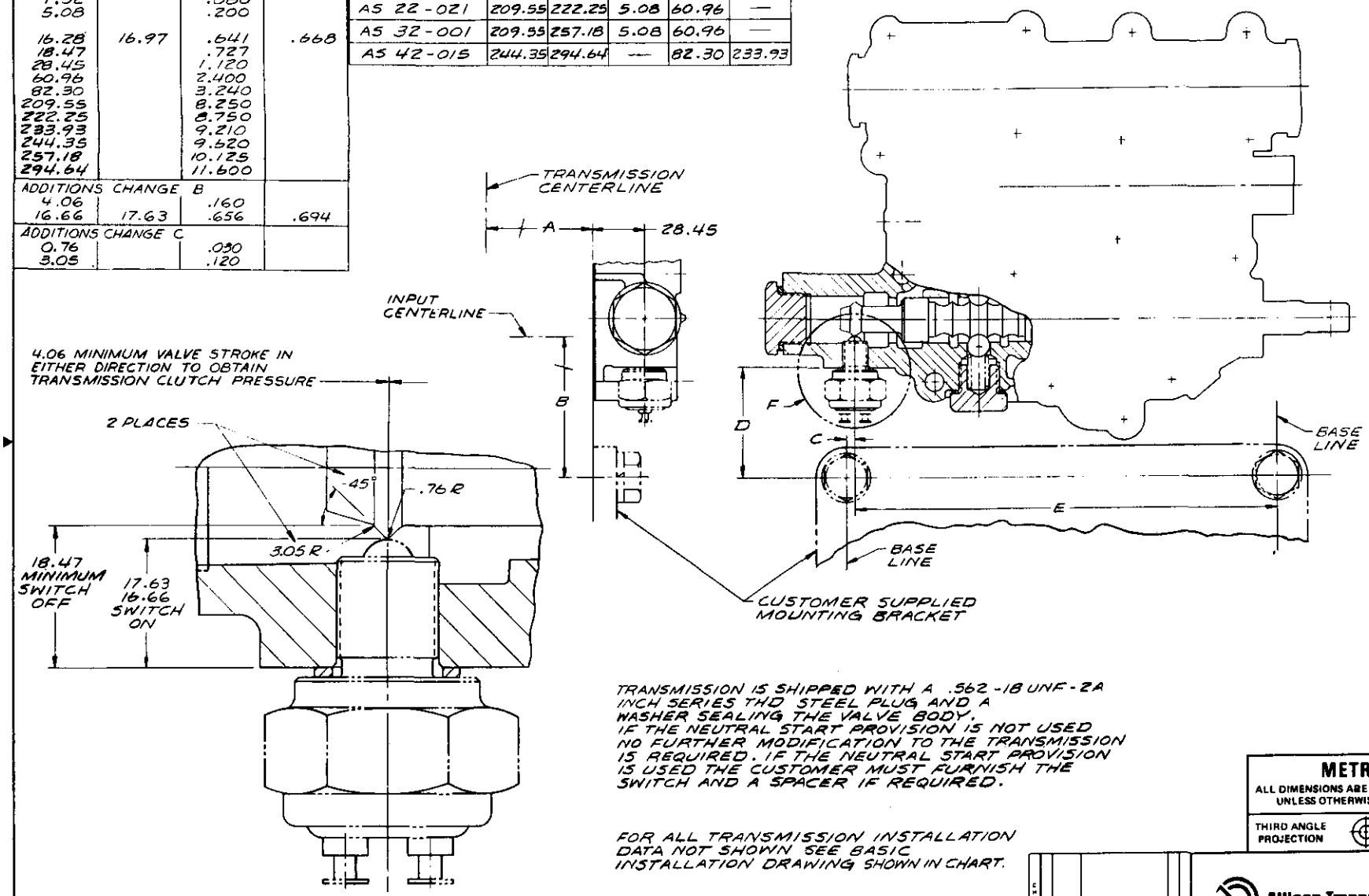
METRIC
ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED
THIRD ANGLE PROJECTION
Allison Transmission
SHEET 1 OF 2
COOLER OIL FLOW DATA

METRIC VALUES	EQUIVALENTS
276 KPa .126 l/s	40 PSI 2 GPM



MILLIMETRES TO INCHES			
mm MIN/NOM	mm MAX	in. MIN/NOM	in. MAX
1.52		.060	
5.08		.200	
16.28	16.97	.641	.668
18.47		.727	
28.45		1.120	
60.96		2.400	
82.30		3.240	
209.55		8.250	
222.25		8.750	
233.93		9.210	
244.35		9.620	
257.18		10.125	
294.64		11.600	
ADDITIONS CHANGE B			
4.06		.160	
16.66	17.63	.656	.694
ADDITIONS CHANGE C			
0.76		.030	
3.05		.120	

BASIC INSTALLATION DRAWING	DIMENSION				
	A	B	C	D	E
AS 22-003	209.55	222.25	5.08	60.96	—
AS 22-021	209.55	222.25	5.08	60.96	—
AS 32-001	209.55	257.18	5.08	60.96	—
AS 42-015	244.35	294.64	—	82.30	233.93



ENLARGED VIEW F
SCALE 4.0 TIMES

AS 00-052

TRANSMISSION IS SHIPPED WITH A .562-18 UNF-2A INCH SERIES THD STEEL PLUG AND A WASHER SEALING THE VALVE BODY. IF THE NEUTRAL START PROVISION IS NOT USED NO FURTHER MODIFICATION TO THE TRANSMISSION IS REQUIRED. IF THE NEUTRAL START PROVISION IS USED THE CUSTOMER MUST FURNISH THE SWITCH AND A SPACER IF REQUIRED.

FOR ALL TRANSMISSION INSTALLATION DATA NOT SHOWN SEE BASIC INSTALLATION DRAWING SHOWN IN CHART.

METRIC
ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

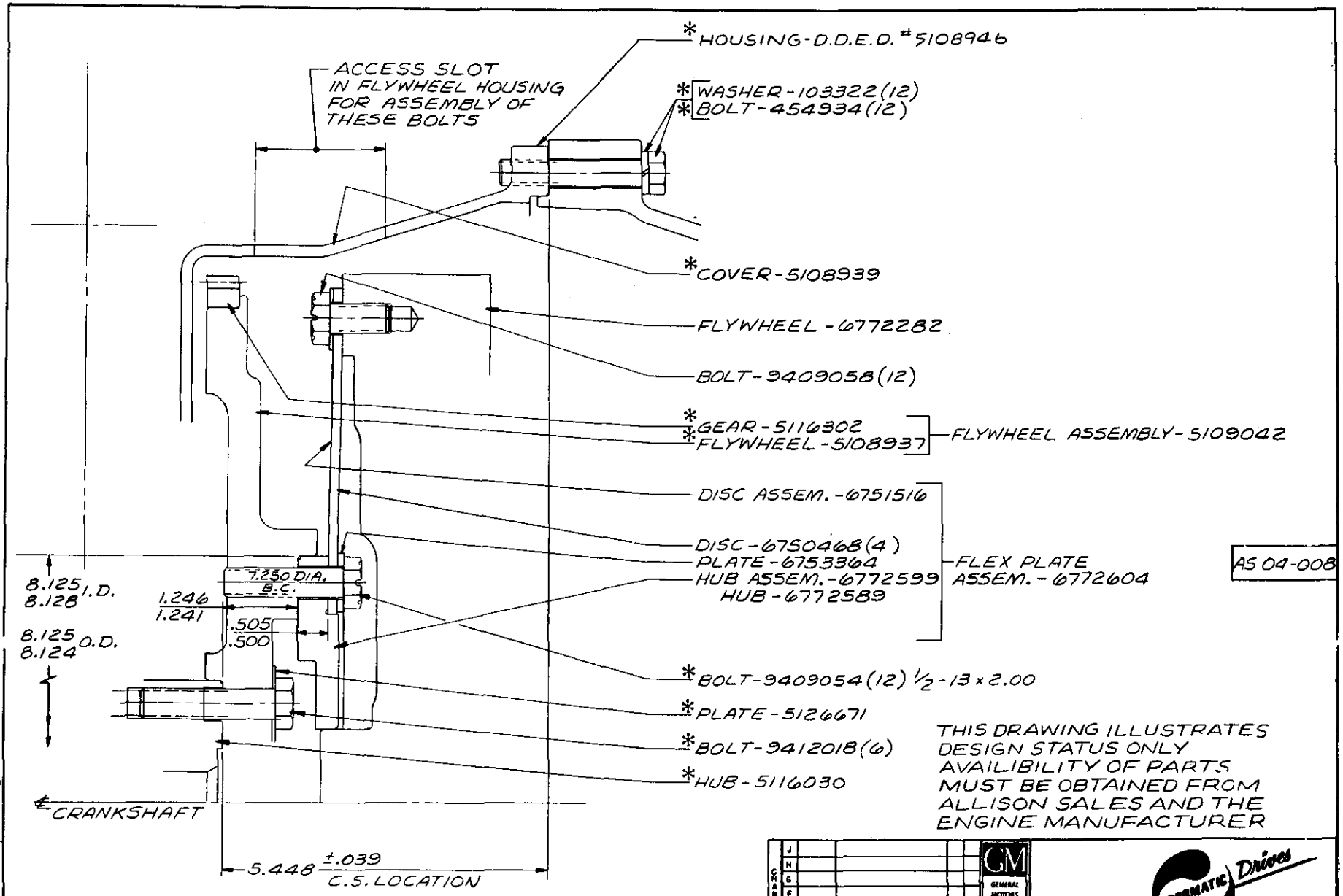
Allison Transmissions

TITLE NEUTRAL START SWITCH PROVISION

MODEL TT/TRT SERIES AS 00-052

Detroit Diesel Allison Division of General Motors - Indianapolis, Indiana

FORM 8202 S



FOR CONVERTER DRIVE DATA NOT SHOWN SEE DRAWING AS 00-001

*DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY

BASIC INSTALLATION DRAWING AS 51-003

THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY AVAILIBILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND THE ENGINE MANUFACTURER

REF. AS 04-007 & DDED #L-11-490D

ALLISON DIVISION
GENERAL MOTORS CORPORATION

CHANGES			
J			
H			
G			
F			
E			
D			
C	7-16-62	REV. TO DATE	
B	10-19-61	REV. TO DDED #L-11-490	
A	12-28-60	WAS 5.272 DIM. NOW 5.448	

DRAWN	CHECKED	ENG. SUPERVISOR
SMEANY	G.E. HIGGINS	RTS 6
11-9-60	10-30-61	10-31-61
SCALE	PROJ. ENGR.	APPL. ENGR.
FULL	D. ST. JOHN	P.B. BONHAM
	10-28-61	10-28-61

GM GENERAL MOTORS

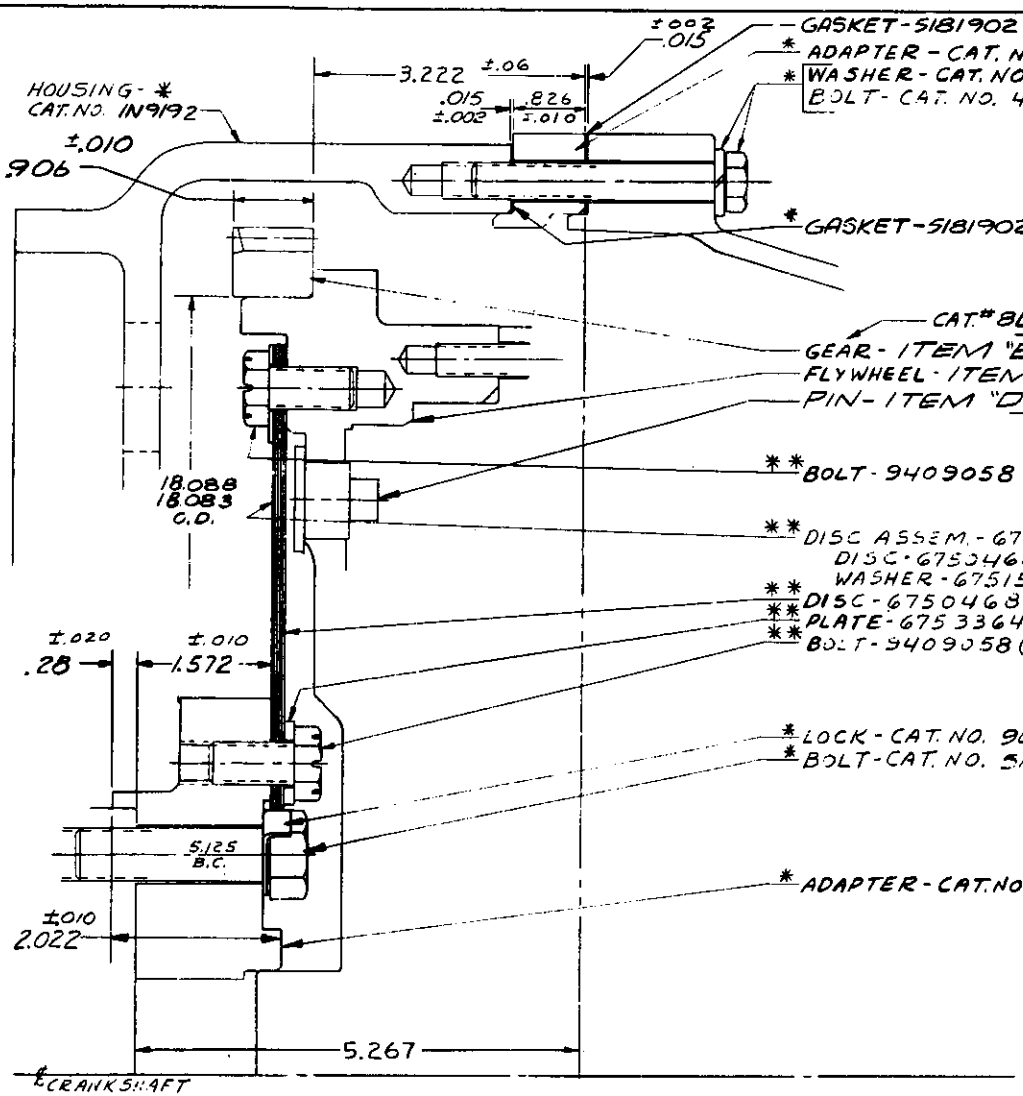
Allison TORQMATIC Drives

TITLE: PHYSICAL ADAPTATION TO D.D.E.D. 6V-53

MODEL TC-400 AS 04-008

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA

FORM 1048-C REV. 2-56



ITEM	700 SERIES LOCK-UP	TC-400 NO LOCK-UP
A	6884576	6836566
B	6836565	6836565
C	6883917	6836564
D	6883915	NONE

AS 04-114

APPLICABLE TO ENGINE MODELS
1673C
D330C
D333C

APPLICABLE TO 3306/700 SERIES WITHOUT PIN TIMING FEATURE

NOTE :
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY. AVAILABITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND THE ENGINE MANUFACTURER

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

BASIC INSTALLATION DWG. AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH TC-400 CONVERTER ASSEMBLY

* OR ** DENOTES PARTS NOT SUPPLIED WITH 700 SERIES TRANSMISSION ASSEMBLY

C	30SEP82	4W229 WAS 6N9918	
B	11-9-77	ADDED TABLE & ENV NOTES	
A	2-8-77	REVISED PARA. CHG.	

D. NE — HIGGINS 11-6-63 — MUELLER 10-3-63 — LEWIS 10-31-63 — SCALE FULL

GM GENERAL MOTORS — Allison TORQMATIC Drives

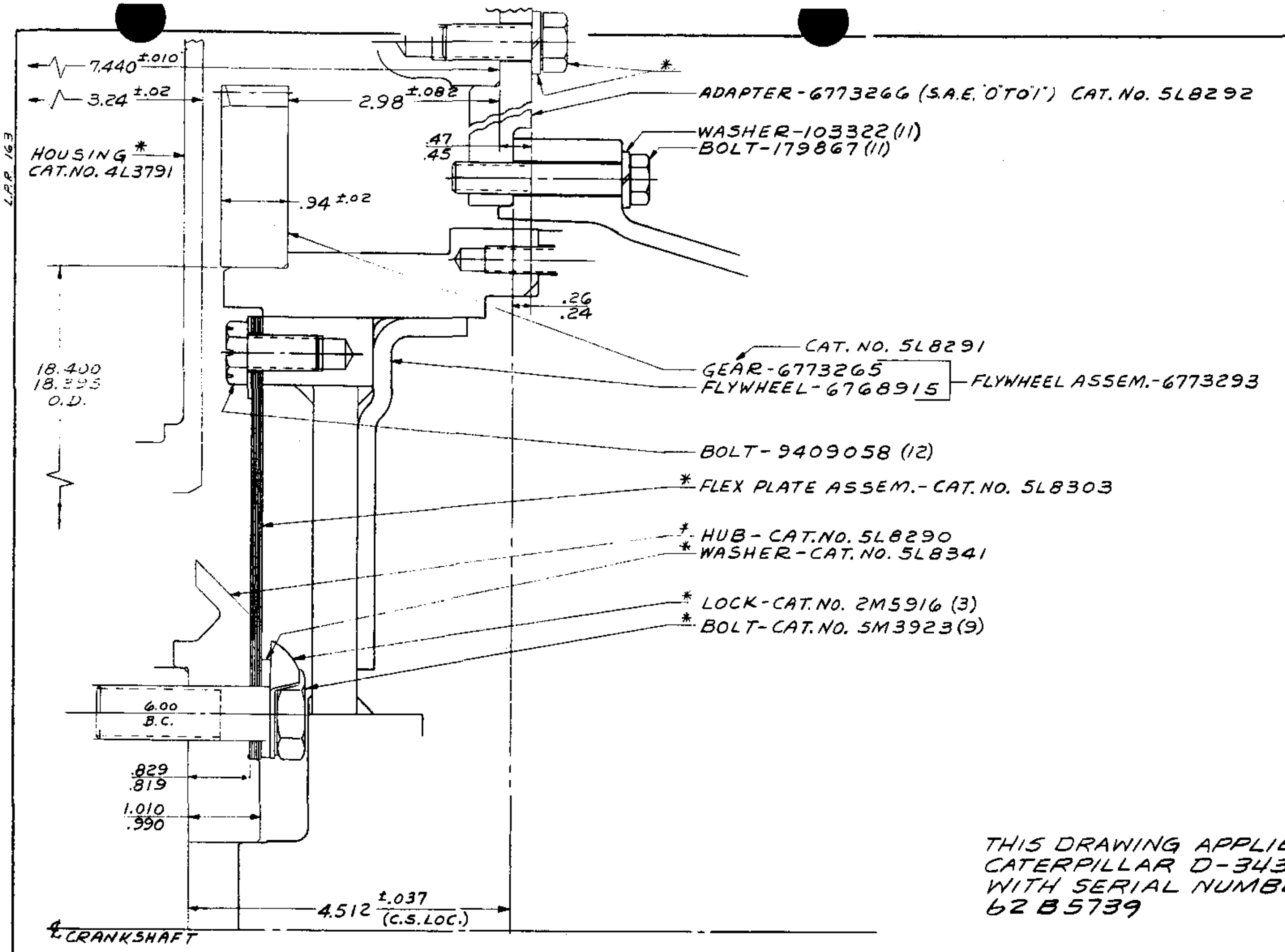
TITLE: CATERPILLAR "C" SERIES PHYSICAL ADAPT.

MODEL TC-400/700 SERIES — AS 04-114

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA

REF. AS 04-028, AS 04-033

06-13 & 07-83



AS04-022

THIS DRAWING APPLIES ONLY TO CATERPILLAR D-343 ENGINES WITH SERIAL NUMBERS BELOW 62B5739

REF. CAT. NO. 27026-1

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS00-001

BASIC INSTALLATION DWG. AS51-003

*DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

CHANGES: A 1-11-74 ADDED SERIAL NO. NOTE

DRAWN: SWEANY 1-31-62 | CHECKED: HIGGINS 6-11-62 | CHF. DRAFTSMAN: RTS 6-11-62

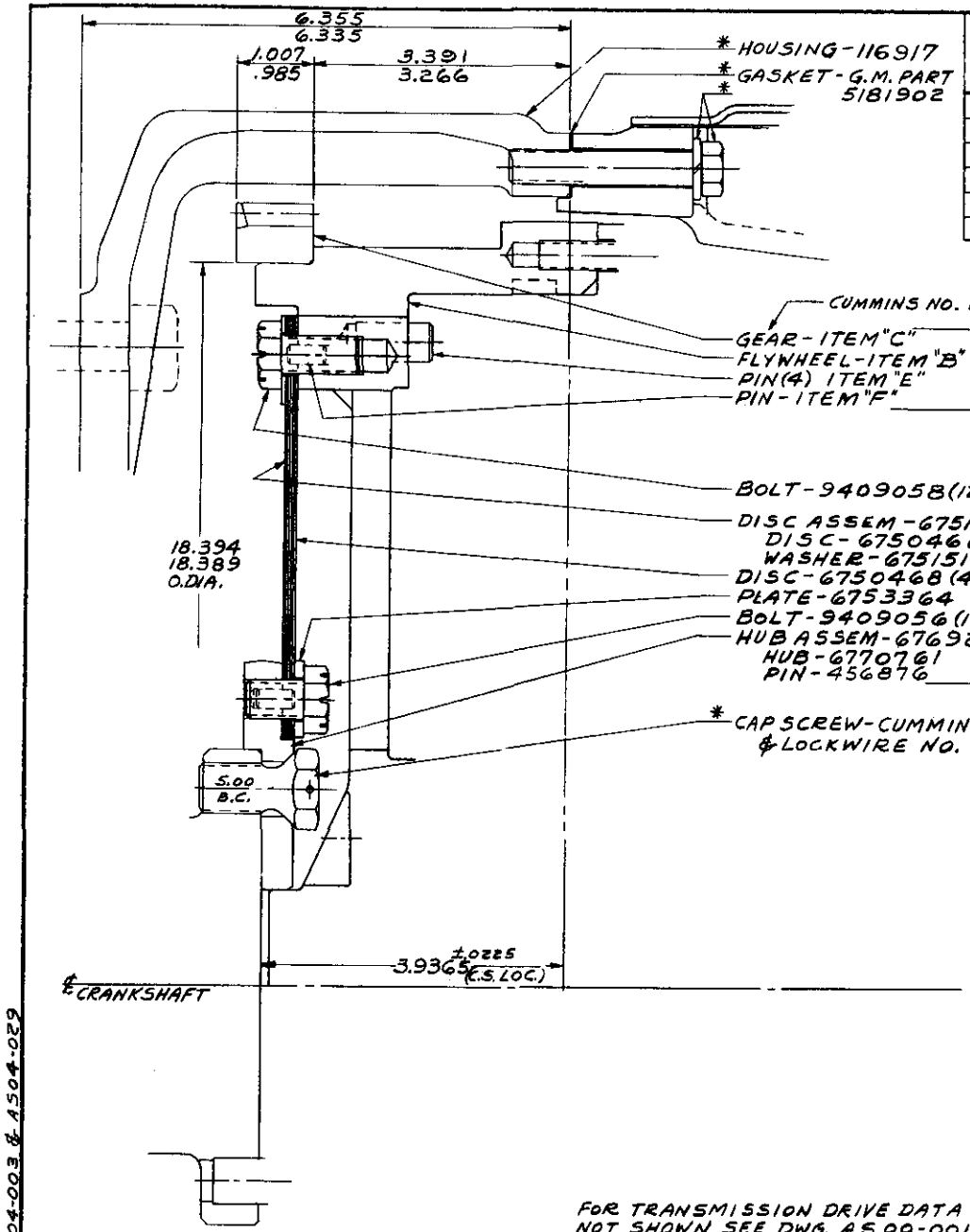
SCALE: FULL | PROJ. ENGR.: ST JOHN 5-29-62 | APPL. ENGR.:

GM GENERAL MOTORS — Allison TORQMATIC Drives

TITLE: CATERPILLAR "D-343" PHYSICAL ADAPT.

MODEL TC-500 — AS04-022

ALLISON DIVISION-GENERAL MOTORS CORPORATION-INDIANAPOLIS, INDIANA



ITEM	24-045 NO STARTER GEAR		24-050	24-016 BENDIX TYPE STARTER GEAR		24-095 DYER TYPE STARTER GEAR	72-152
	NO LOCK-UP CLUTCH	LOCK-UP CLUTCH	LOCK-UP CLUTCH	NO LOCK-UP CLUTCH	LOCK-UP CLUTCH	NO LOCK-UP CLUTCH	LOCK UP CLUTCH
A	NONE	6770911	6770913	6768926	6770908	6768928	6770910
B	6768918	6770891	6770891	6768918	6770891	6768918	6770891
C	NONE	NONE	NONE	6752502	6752502	6751948	6751948
D	NONE	NONE	NONE	124509	124509	124516	124516
E	NONE	6772832	6772832	NONE	6772832	NONE	6772832
F	NONE	456876	NONE	NONE	456876	NONE	456876

FOR TRANSMISSION DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

* DENOTES PARTS NOT SUPPLIED WITH TRANSMISSION ASSEMBLY.

REF. AS04-003 & AS04-029

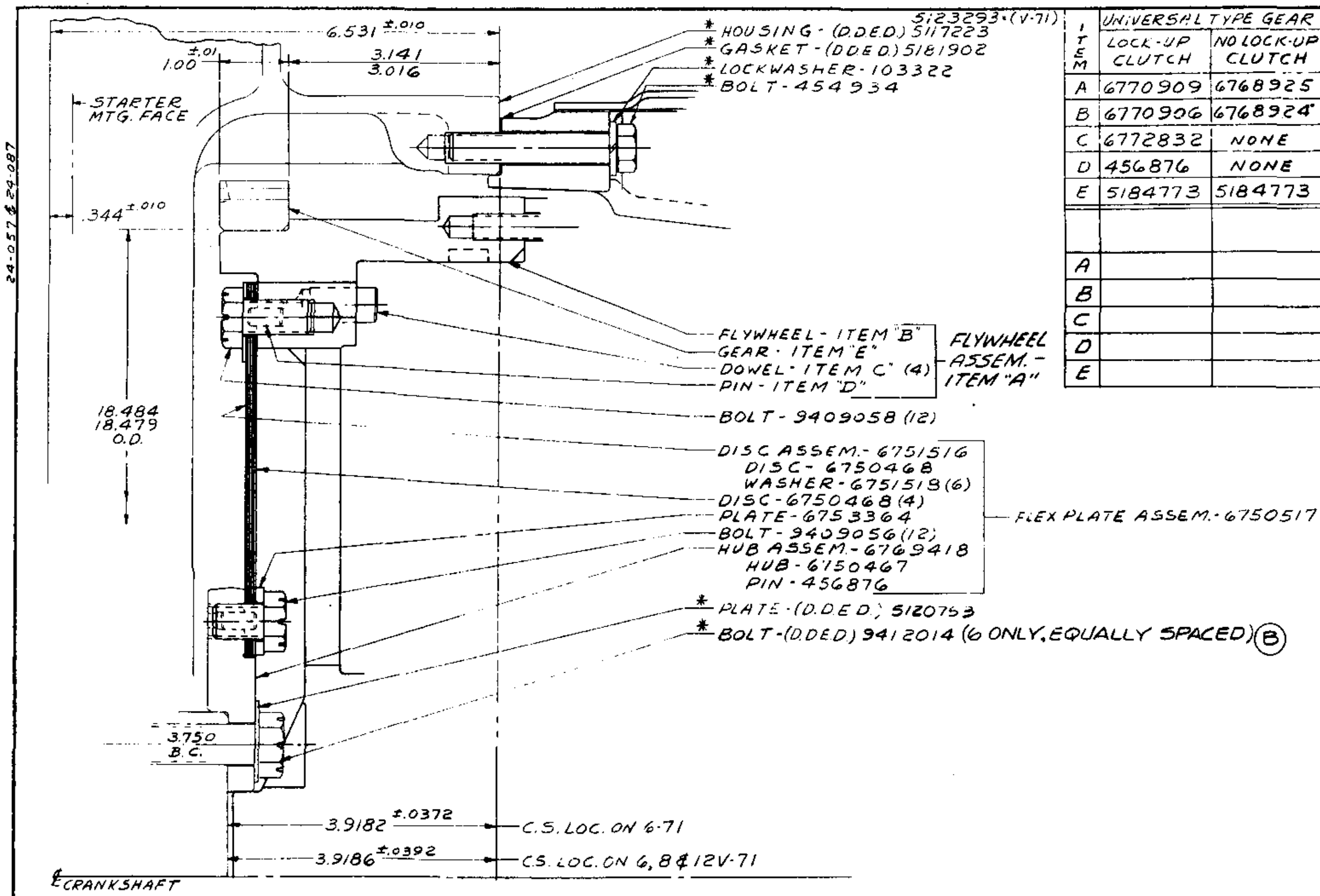
AS04-024

DRAWN	SWEANY 2-15-62	CHECKED	HIGGINS 4-30-62
ENGR. SUPERVISION	RJS 5-1-62	SCALE	FULL
PROJ. ENGR.	ROBINSON 4-30-62	APPL. ENGR.	WELCHER 4-30-62

TITLE: "H & N" CUMMINS IN LINE PHYSICAL ADAPT.

MODEL 5000 SERIES TRANSMISSION AS04-024

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA


6.531 ±.010
1.00 ±.01
3.141
3.016
STARTER MTG. FACE
.344 ±.010
18.484
18.479
O.D.
24-057 & 24-087
5123293-(V-71)
* HOUSING-(D.D.E.D.) 5117223
* GASKET-(D.D.E.D.) 5181902
* LOCKWASHER-103322
* BOLT-454934
FLYWHEEL-ITEM "B"
GEAR-ITEM "E"
DOWEL-ITEM "C" (4)
PIN-ITEM "D"
FLYWHEEL ASSEM.-ITEM "A"
BOLT-9409058 (12)
DISC ASSEM.-6751516
DISC-6750468
WASHER-6751518 (6)
DISC-6750468 (4)
PLATE-6753364
BOLT-9409056 (12)
HUB ASSEM.-6769418
HUB-6750467
PIN-456876
FLEX PLATE ASSEM.-6750517
* PLATE-(D.D.E.D.) 5120753
* BOLT-(D.D.E.D.) 9412014 (6 ONLY, EQUALLY SPACED) (B)
3.750
B.C.
3.9182 ±.0372
C.S. LOC. ON 6-71
3.9186 ±.0392
C.S. LOC. ON 6, 8 & 12V-71
℄ CRANKSHAFT

ITEM	UNIVERSAL TYPE GEAR LOCK-UP CLUTCH	UNIVERSAL TYPE GEAR NO LOCK-UP CLUTCH	BENDIX TYPE GEAR LOCK-UP CLUTCH	BENDIX TYPE GEAR NO LOCK-UP CLUTCH
A	6770909	6768925	6773381	6773577
B	6770906	6768924	6770906	6768924
C	6772832	NONE	6772832	
D	456876	NONE	456876	
E	5184773	5184773	5166664	5166664
				MODEL CRT 7033
A				6880554
B				6880294
C				
D				
E				5166664

AS04-025

FOR TRANSMISSION DRIVE DATA NOT SHOWN SEE DWG. AS00-001.

BASIC INSTALLATION DWG. AS58-029 & AS58-031

* DENOTES PARTS NOT SUPPLIED WITH TRANSMISSION ASSEMBLY

REF. AS04-019

CHANGES			
C	1-3-081	5120753 WAS 5110784	
B	2-3-79	WAS (6)	
A	10-11-73	ADDED CRT 7033 CONFIG.	

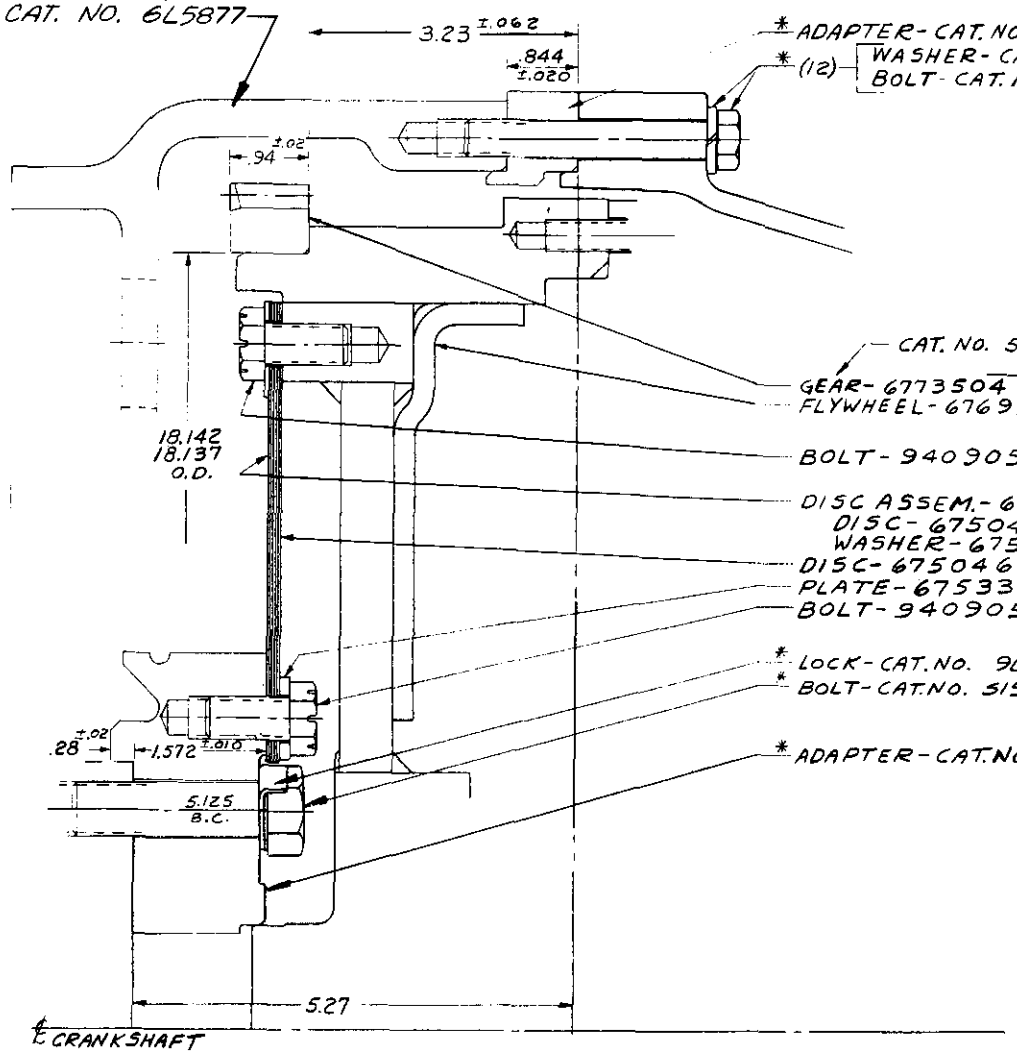
DRAWN: SWEANY 2-12-63 — CHECKED: HIGGINS 5-16-63 — ETS 5-16-63
SCALE: FULL — PROJ. ENGR. ROBINSON 5-8-63 — APPL. ENGR. WELCHER 5-8-63

GM GENERAL MOTORS — Allison TORQMATIC Drives

TITLE: DETROIT DIESEL "6, 8, 12V-71 & 6-71" PHYSICAL ADAPT.

MODEL: 5000 & 6000 SERIES TRANSMISSION — AS04-025

ALLISON DIVISION-GENERAL MOTORS CORPORATION-INDIANAPOLIS, INDIANA-



AS 04-028

THIS DRAWING APPLIES ONLY TO CATERPILLAR D 333 AND 1673 ENGINES IN THE FOLLOWING SERIAL NO. SERIES:

D333	1673
79B1 AND UP	70B1 AND UP
58B312 AND UP	78B1 AND UP
87B1 AND UP	
66D1 TO 66D1929	
23C1 TO 23C321	

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY. AVAILABILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND ENGINE MANUFACTURER

BASIC INSTALLATION DWG. AS 51-003

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

CHANGE			
J			
H			
G			
F			
E			
D			
C			
B	1-11-74	ADDED SERIAL NO. NOTE	PJ
A	10-2-67	SEE REV. NOTICE	AL-SG

DRAWN	CHKD	CHF. ENGR.
SWEANY 3-6-62	HIGGINS 6-12-62	RTS 6-12-62
SCALE FULL	PROJ. ENGR. ST JOHN 5-29-62	APPD. ENGR. EPW 6-12-62

GM GENERAL MOTORS

Allison TORQMATIC Drives

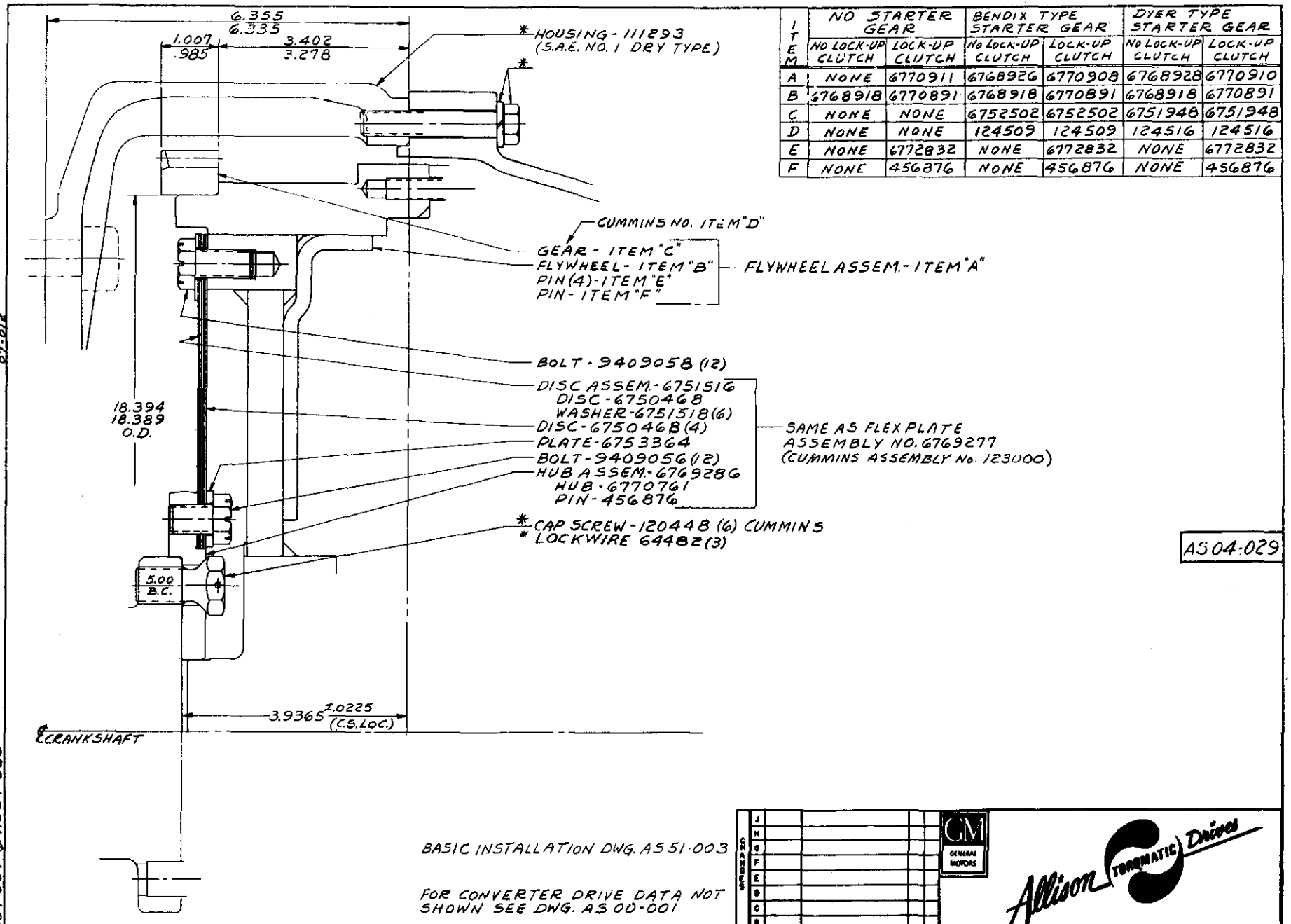
TITLE: CATERPILLAR "1673" & "D-333" PHYSICAL ADAPT.

MODEL TC-500 AS04-028

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA

REF. CAT. NO. 15943-1

26-126 & 27-C 33



ITEM	NO STARTER GEAR		BENDIX TYPE STARTER GEAR		DYER TYPE STARTER GEAR	
	NO LOCK-UP CLUTCH	LOCK-UP CLUTCH	NO LOCK-UP CLUTCH	LOCK-UP CLUTCH	NO LOCK-UP CLUTCH	LOCK-UP CLUTCH
A	NONE	6770911	6768926	6770908	6768928	6770910
B	6768918	6770891	6768918	6770891	6768918	6770891
C	NONE	NONE	6752502	6752502	6751948	6751948
D	NONE	NONE	124509	124509	124516	124516
E	NONE	6772832	NONE	6772832	NONE	6772832
F	NONE	456876	NONE	456876	NONE	456876

AS 04-029

BASIC INSTALLATION DWG. AS 51-003

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

CHANGES: J, H, G, F, E, D, C, B, A

SWEANY 5-12-66 | N. HIGGINS 5-16-66 | PROJ. ENGR. D. ST. JOHN 5-10-66 | RTS 5-16-66 APPL. ENGR. | SCALE FULL

GM GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: "H&N CUMMINS IN LINE" PHYSICAL ADAPT.

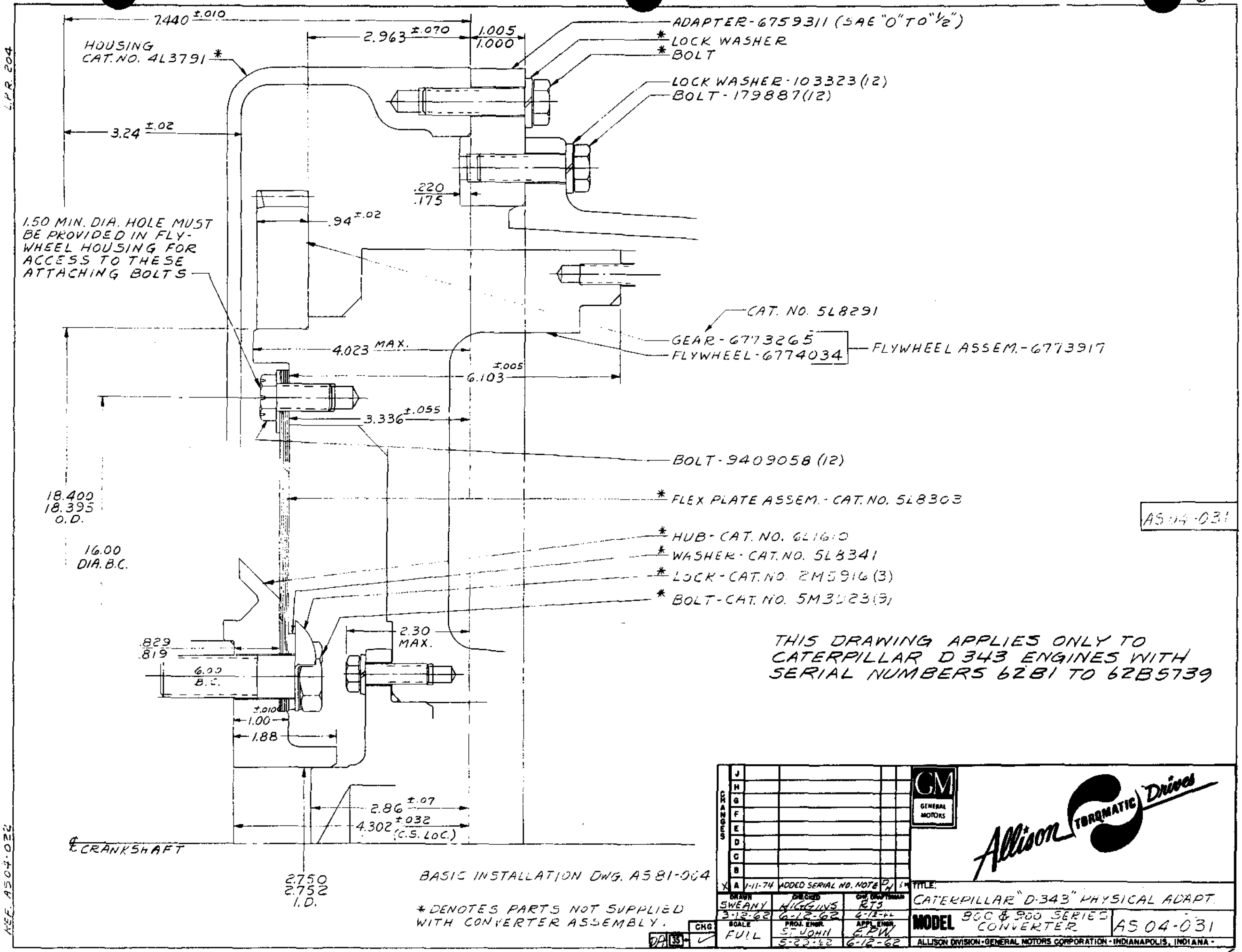
MODEL 500 SERIES CONVERTER

AS 04-029

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA

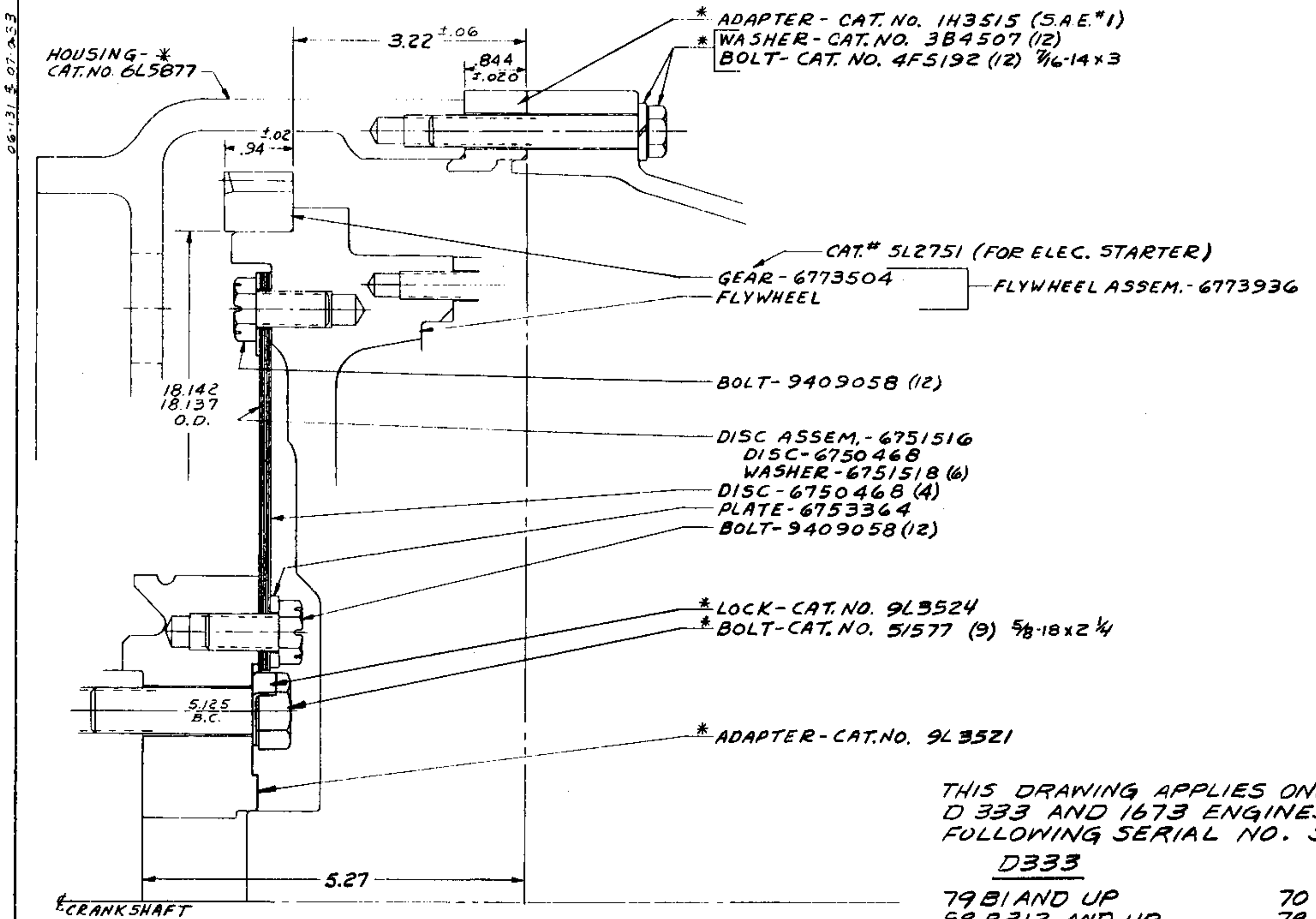
REF. AS04-024 & AS04-003

06-072, 06-095, 06-013, 04-094, 04-071 & 04-093
07-012



HOUSING
CAT. NO. 4L3791 *
7.440 ±.010
2.963 ±.070
1.005
1.000
ADAPTER-6759311 (SAE "0" TO "1/2")
* LOCK WASHER
* BOLT
LOCK WASHER-103323 (12)
BOLT-179887 (12)
3.24 ±.02
.220
.175
.94 ±.02
1.50 MIN. DIA. HOLE MUST BE PROVIDED IN FLY-WHEEL HOUSING FOR ACCESS TO THESE ATTACHING BOLTS
CAT. NO. 5L8291
GEAR-6773265
FLYWHEEL-6774034
FLYWHEEL ASSEM.-6773917
4.023 MAX.
6.103 ±.005
3.336 ±.055
BOLT-9409058 (12)
* FLEX PLATE ASSEM.-CAT. NO. 5L8303
18.400
18.395
O.D.
16.00
DIA. B.C.
* HUB-CAT. NO. 6L1610
* WASHER-CAT. NO. 5L8341
* LOCK-CAT. NO. 2M5916 (3)
* BOLT-CAT. NO. 5M3323 (9)
2.30
MAX.
.829
.819
6.00
B.C.
1.00 ±.010
1.88
THIS DRAWING APPLIES ONLY TO CATERPILLAR D 343 ENGINES WITH SERIAL NUMBERS 62B1 TO 62B5739
2.86 ±.07
4.302 ±.032 (C.S. LOC.)
℄ CRANKSHAFT
2.750
2.752
I.D.
BASIC INSTALLATION DWG. AS 81-004
* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.
AS 04-031
CHANGES
A 1-11-74 ADDED SERIAL NO. NOTE
DRAWN SWEANY 3-12-62
CHECKED HIGGINS 6-12-62
CHIEF DRAFTSMAN RTS 6-12-62
SCALE FULL
PROJ. ENGR. ST JOHN 5-23-62
APPL. ENGR. EPW 6-12-62
GM GENERAL MOTORS
Allison TORQMATIC Drives
TITLE: CATERPILLAR "D-343" PHYSICAL ADAPT.
MODEL 800 & 900 SERIES CONVERTER
AS 04-031
ALLISON DIVISION-GENERAL MOTORS CORPORATION-INDIANAPOLIS, INDIANA

REF. AS 04-032



06-131 & 07-033
HOUSING-* CAT. NO. 6L5877
3.22 ±.06
.844 ±.020
±.02
.94
* ADAPTER - CAT. NO. 1H3515 (S.A.E.#1)
* WASHER - CAT. NO. 3B4507 (12)
BOLT - CAT. NO. 4F5192 (12) 7/16-14×3
CAT.# 5L2751 (FOR ELEC. STARTER)
GEAR - 6773504
FLYWHEEL
FLYWHEEL ASSEM. - 6773936
BOLT - 9409058 (12)
18.142
18.137
O.D.
DISC ASSEM. - 6751516
DISC - 6750468
WASHER - 6751518 (6)
DISC - 6750468 (4)
PLATE - 6753364
BOLT - 9409058 (12)
* LOCK - CAT. NO. 9L3524
* BOLT - CAT. NO. 51577 (9) 5/8-18×2 1/4
5.125 B.C.
* ADAPTER - CAT. NO. 9L3521
5.27
℄ CRANKSHAFT

AS 04-033

THIS DRAWING APPLIES ONLY TO CATERPILLAR D 333 AND 1673 ENGINES IN THE FOLLOWING SERIAL NO. SERIES

D333	1673
79 B1 AND UP	70 B1 AND UP
58 B312 AND UP	78 B1 AND UP
87 B1 AND UP	
66 D1 TO 66 D 1929	
23C1 TO 23C 321	

NOTE :
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY. AVAILABITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND ENGINE MANUFACTURER

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

BASIC INSTALLATION DWG. AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

REF. AS 04-028

CHANGES				
J				
N				
G				
F				
E				
D				
C	9-7-78	FLYWHEEL WAS FLYWHEEL 6773936	KDS	P.C.
B	1-11-74	ADDED SERIAL NO. NOTE	DN	YM
A	10-2-67	SEE REV. NOTICE	MK	SG

DRAWN	CHECKED	CHF. DRAFTSMAN
SWEANY 4-12-62	HIGGINS 6-12-62	RTS 6-12-62
SCALE: FULL	PROJ. ENGR. ST JOHN 5-29-62	APPL. ENGR. EPW. 6-12-62

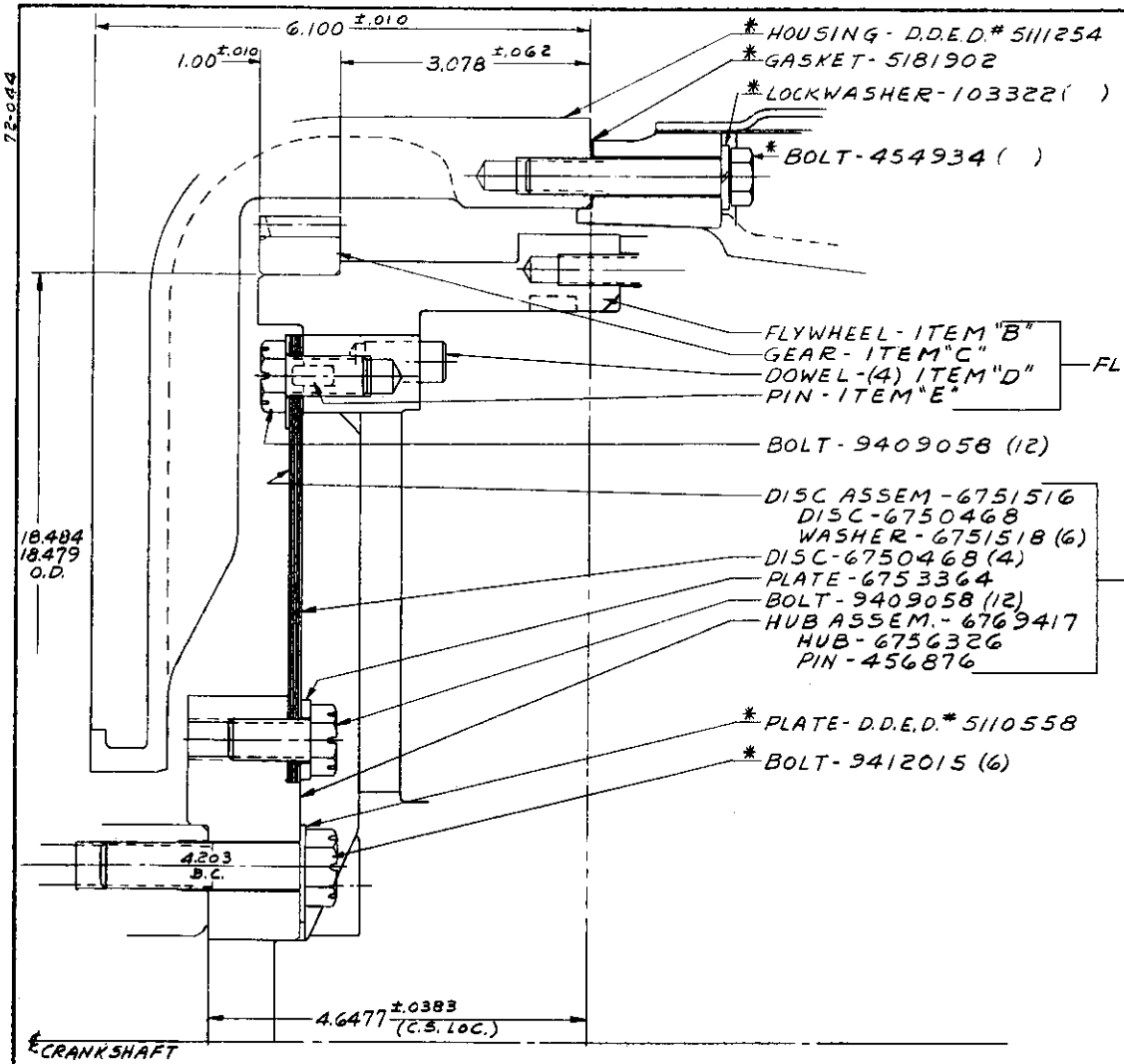
CHG ✓ DA 35

GM GENERAL MOTORS — Allison TORQMATIC Drives

TITLE: CATERPILLAR "1673 & D-333" PHYSICAL ADAPT.

MODEL TC-400 — AS 04-033

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



ITEM	UNIVERSAL STARTER GEAR		BENDIX STARTER GEAR	
	LOCKUP CLUTCH	NO LOCKUP CLUTCH	LOCKUP CLUTCH	NO LOCKUP CLUTCH
A	6770909	6768925	6773381	6773577
B	6770906	6768924	6770906	6768924
C	5184773	5184773	5166664	5166664
D	6772832		6772832	
E	456876		456876	

AS 04-036

BASIC INSTALLATION DWG. AS 58-029, AS 58-031, AS 56-002 OR AS 56-003

FOR TRANSMISSION DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

* DENOTES PARTS NOT SUPPLIED WITH TRANSMISSION ASSEMBLY.

DRAWN SWEANY 4-4-62	CHECKED WIGGINS 5-17-62	GM ENGINEERING 1275 5-17-62	
SCALE FULL	PROJ. ENGR. ST JOHN 6-7-62	APPL. ENGR.	

CHG ✓

GM GENERAL MOTORS

Allison TORQMATIC Drives

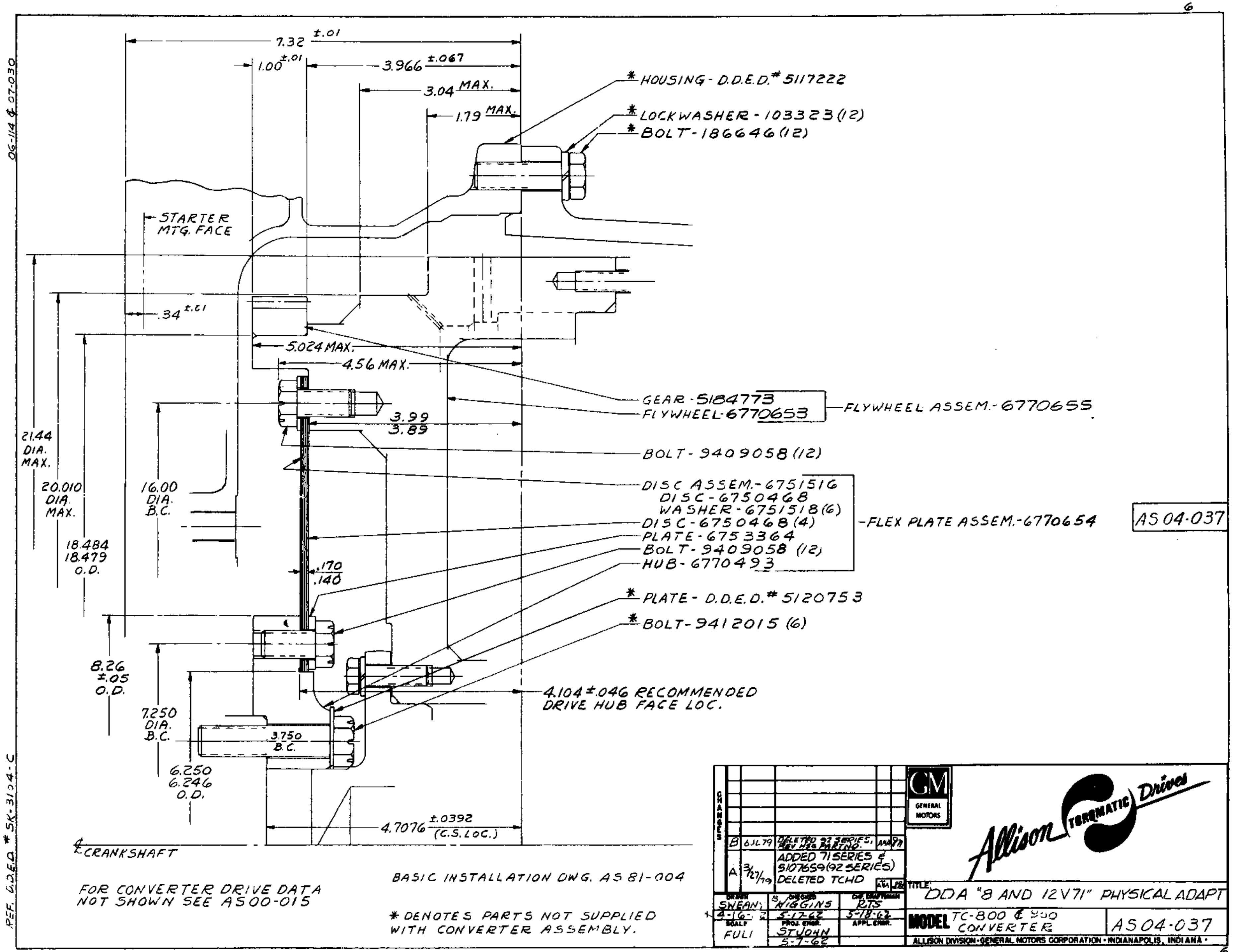
TITLE: DETROIT DIESEL "6-110" PHYSICAL ADAPT.

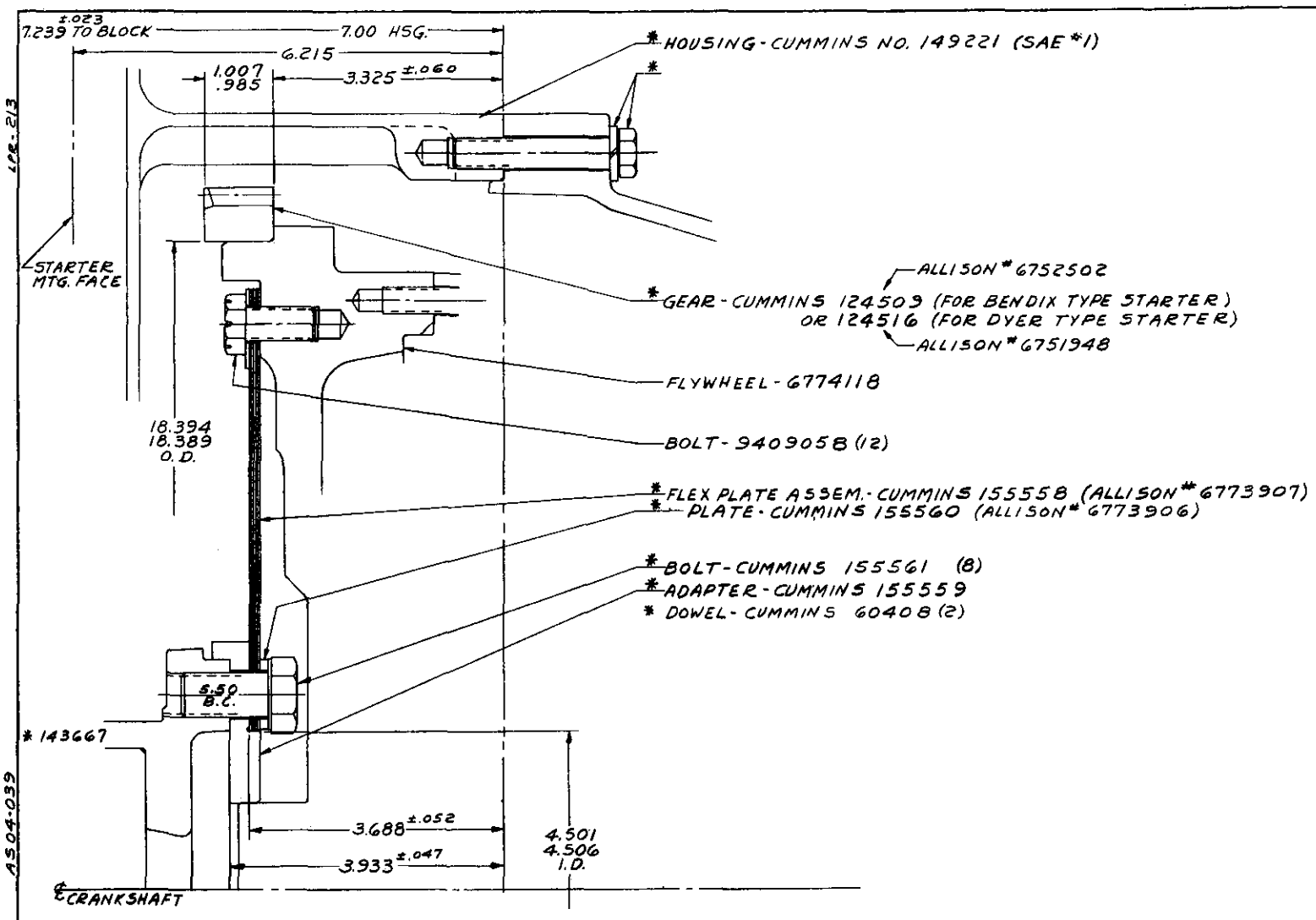
MODEL 5000 & 6000 SERIES TRANSMISSION | AS 04-036

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA

REF. AS 04-025

72-044


7.32 ±.01
1.00 ±.01
3.966 ±.067
3.04 MAX.
1.79 MAX.
* HOUSING - D.D.E.D.* 5117222
* LOCKWASHER - 103323 (12)
* BOLT - 186646 (12)
STARTER MTG. FACE
.34 ±.01
5.024 MAX.
4.56 MAX.
GEAR - 5184773
FLYWHEEL - 6770653
FLYWHEEL ASSEM. - 6770655
3.99
3.89
BOLT - 9409058 (12)
21.44 DIA. MAX.
20.010 DIA. MAX.
16.00 DIA. B.C.
18.484
18.479
O.D.
DISC ASSEM. - 6751516
DISC - 6750468
WASHER - 6751518 (6)
DISC - 6750468 (4)
PLATE - 6753364
BOLT - 9409058 (12)
HUB - 6770493
FLEX PLATE ASSEM. - 6770654
.170
.140
* PLATE - D.D.E.D.* 5120753
* BOLT - 9412015 (6)
8.26 ±.05 O.D.
4.104 ±.046 RECOMMENDED DRIVE HUB FACE LOC.
7.250 DIA. B.C.
3.750 B.C.
6.250
6.246
O.D.
4.7076 ±.0392 (C.S. LOC.)
℄ CRANKSHAFT
FOR CONVERTER DRIVE DATA NOT SHOWN SEE AS00-015
BASIC INSTALLATION DWG. AS 81-004
* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.
AS 04-037
CHANGES
B 6JL79 DELETED 92 SERIES, REV. USG PARTNO.
A 3/27/79 ADDED 71 SERIES & 5107659 (92 SERIES) DELETED TCHD
GM GENERAL MOTORS
Allison TORQMATIC Drives
TITLE DDA "8 AND 12V71" PHYSICAL ADAPT
MODEL TC-800 & 900 CONVERTER
AS 04-037
DRAWN SWEANY 4-16-62
CHECKED HIGGINS 5-17-62
CHF. DRAFTSMAN R.T.S. 5-18-62
SCALE FULL
PROJ. ENGR. ST. JOHN 5-7-62
APPL. ENGR.
ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA
06-114 ¢ 07-030
REF. D.D.E.D. * SK-3104-C



AS04-042

BASIC INSTALLATION DWG. AS 51-003

FOR CONVERTER DRIVE DATA NOT SHOWN SEE AS 00-001

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

DRAWN SWEANY 5-1-62	CHECKED R.K. 5-10-62	APPROVED D.S. 5-12-62	GM GENERAL MOTORS
CHG	SCALE FULL	PROJ. ENGR. ST JOHN 5-10-62	APPL. ENGR. E.W. 5-10-62

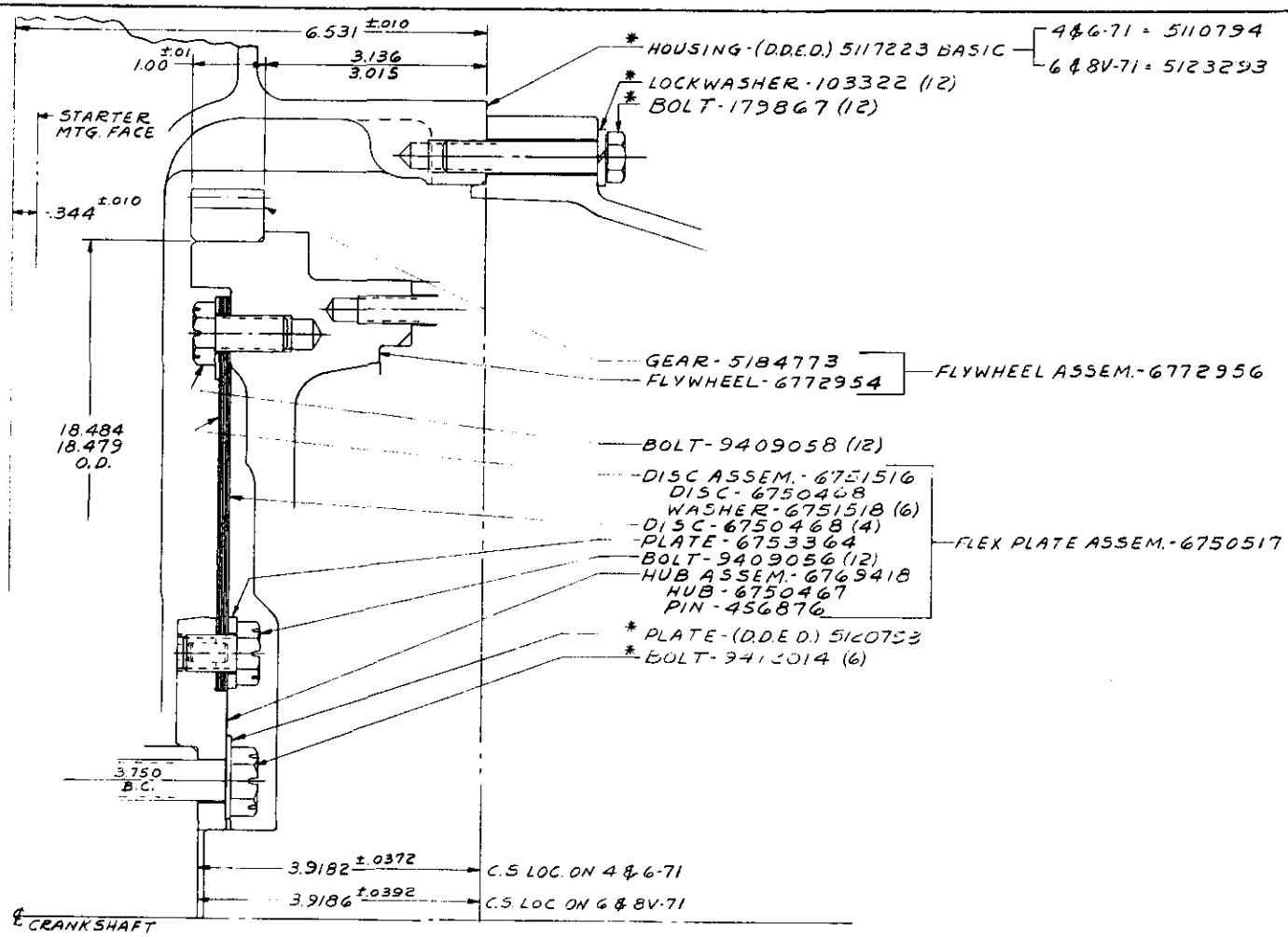
Allison TORQMATIC Drives

TITLE: "V6-200 & CUMMINS V8-265" PHYSICAL ADAPT.

MODEL TC-400 | AS 04-042

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA

REF. CUMMINS #148523 AS04-039 LOR-2/3



AS 04-043

FOR CONVERTER DRIVE DATA NOT SHOWN SEE AS 00-001

BASIC INSTALLATION DWG. AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

J			
H			
G			
F			
E			
D			
C			
B			
A	11-NOV-81	5120753 WAS 5110784	9%

DRAWN SWEANY 5-2-62	CHECKED WIGGINS 5-16-62	ENGR. APPR. RAS 5-16-62
SCALE FULL	PROJ. ENGR. D. ST. JOHN 5-7-62	APPL. ENGR. ROBINSON 5-22-64

GM GENERAL MOTORS

Allison TORQMATIC Drives

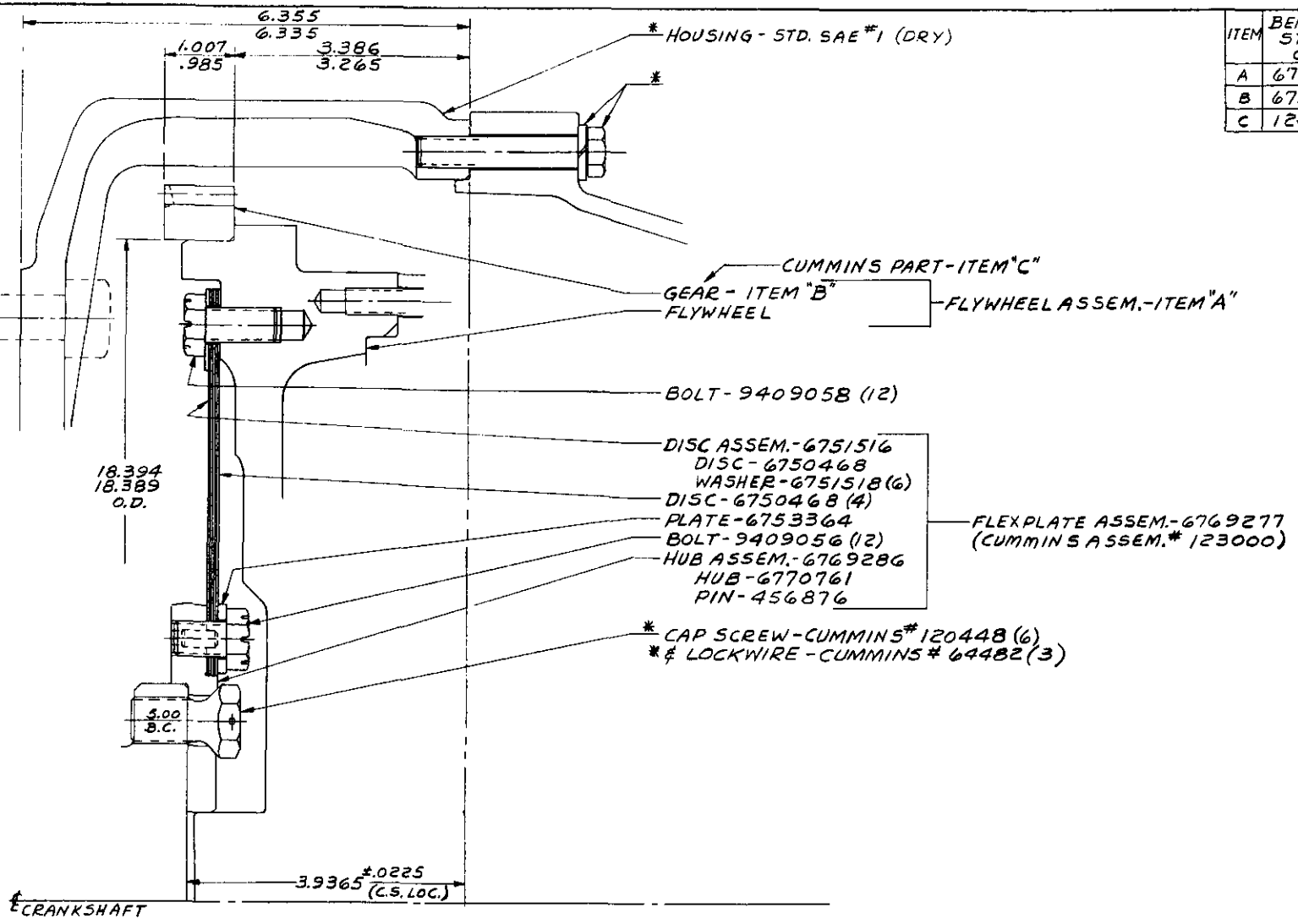
TITLE: DETROIT DIESEL "4-71, 6-71 6V-71 & 8V-71" PHYSICAL ADAPT.

MODEL TC-400

AS 04-043

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA

REF. AS 04-019



ITEM	BENDIX TYPE STARTER GEAR	DYER TYPE STARTER GEAR
A	6774193	6777536
B	6752502	6751948
C	124509	124516

AS 04-045

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

BASIC INSTALLATION DWG. AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

CHANGES			
J			
H			
B			
F			
E			
D			
C			
B			
A	9-11-73	DELETED "6774118"	

DRAWN SWEATY	CHECKED HIGGINS	QUALITY DEPT. RTS
6-6-62	6-12-62	6-12-62
SCALE FULL	PROJ. ENGR. ST. JOHN	APPL. ENGR. EPW
	6-7-62	6-12-62

CHG ✓

GM GENERAL MOTORS

Allison TORQMATIC Drives

4 & 6 CYL.

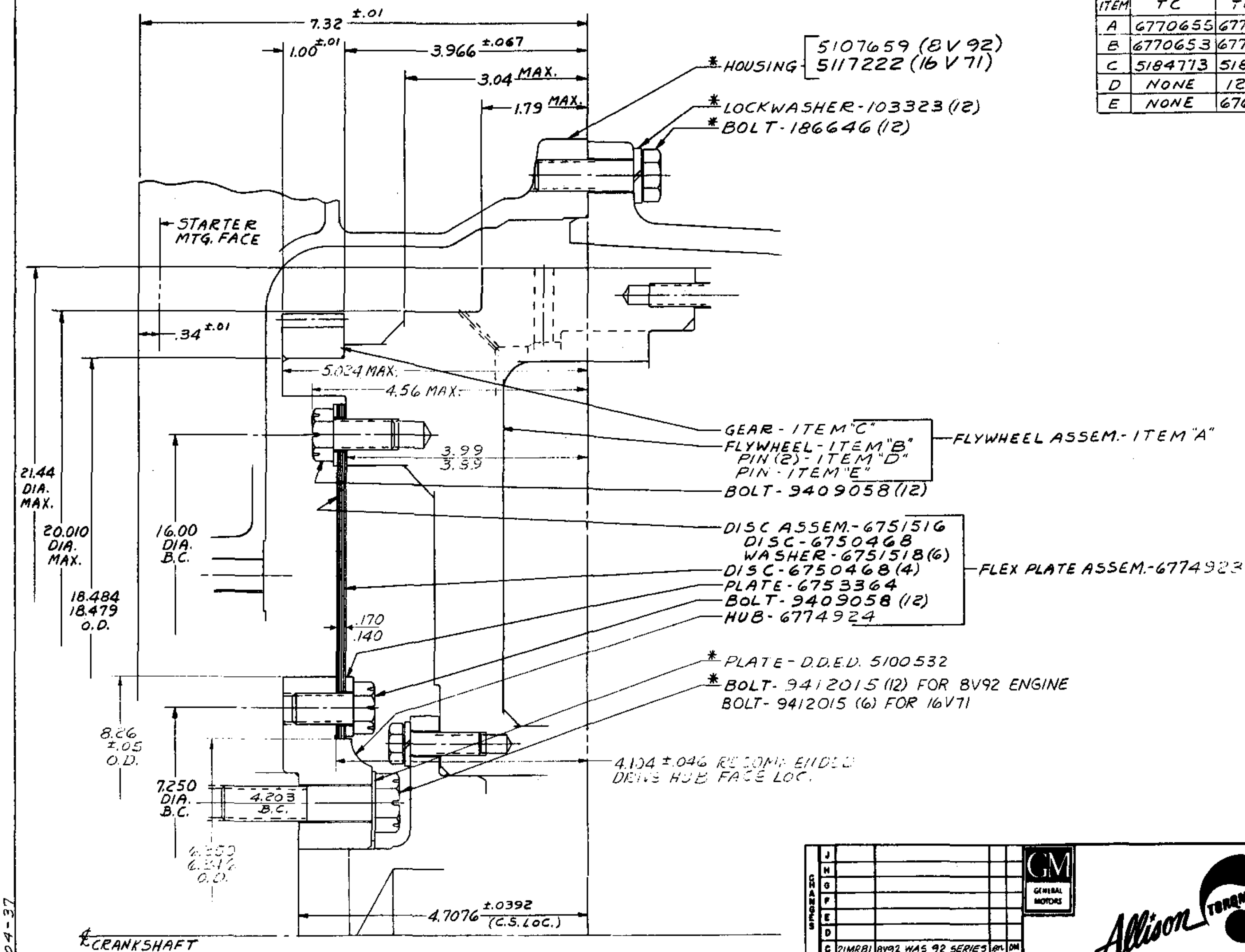
TITLE: CUMMINS "H" IN LINE PHYSICAL ADAPT.

MODEL TC-400 AS04-045

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA

REF. AS 04-003

ITEM	TC	TCHD
A	6770655	6775301
B	6770653	6775302
C	5184773	5184773
D	NONE	125860
E	NONE	6768590



7.32 ±.01
1.00 ±.01
3.966 ±.067
3.04 MAX.
1.79 MAX.
* HOUSING 5107659 (8V92) 5117222 (16V71)
* LOCKWASHER - 103323 (12)
* BOLT - 186646 (12)
STARTER MTG. FACE
.34 ±.01
5.024 MAX.
4.56 MAX.
GEAR - ITEM "C"
FLYWHEEL - ITEM "B"
PIN (2) - ITEM "D"
PIN - ITEM "E"
FLYWHEEL ASSEM. - ITEM "A"
3.99
3.39
BOLT - 9409058 (12)
21.44 DIA. MAX.
20.010 DIA. MAX.
16.00 DIA. B.C.
18.484
18.479 O.D.
DISC ASSEM. - 6751516
DISC - 6750468
WASHER - 6751518 (6)
DISC - 6750468 (4)
PLATE - 6753364
BOLT - 9409058 (12)
HUB - 6774924
FLEX PLATE ASSEM. - 6774923
.170
.140
* PLATE - D.D.E.D. 5100532
* BOLT - 9412015 (12) FOR 8V92 ENGINE
BOLT - 9412015 (6) FOR 16V71
8.26 ±.05 O.D.
4.104 ±.046 RECOMMENDED DRIVE HUB FACE LOC.
7.250 DIA. B.C.
4.203 B.C.
4.7076 ±.0392 (C.S. LOC.)
℄ CRANKSHAFT

AS 04-046

REF. AS04-37

FOR CONVERTER DRIVE DATA NOT SHOWN SEE AS00-015

BASIC INSTALLATION DWG. AS 81-004

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

CHANGES				
J				
H				
G				
F				
E				
D				
C	21MR81	8V92 WAS 92 SERIES		DM
B	18SE80	ADDED 92 SERIES		DM
A	5MR80	ADD 12V92-516... TO ... AND 12V-92 TO TITLE BLOCK		DM

DRAWN	CHECKED	CHIEF DRAFTSMAN
SWEANY	HIGGINS	RTS
6-18-62	5-16-63	5-16-63
SCALE	PROJ. ENGR.	APPL. ENGR.
FULL	ROBINSON	WELCHER
	5-10-63	5-10-63

GM GENERAL MOTORS

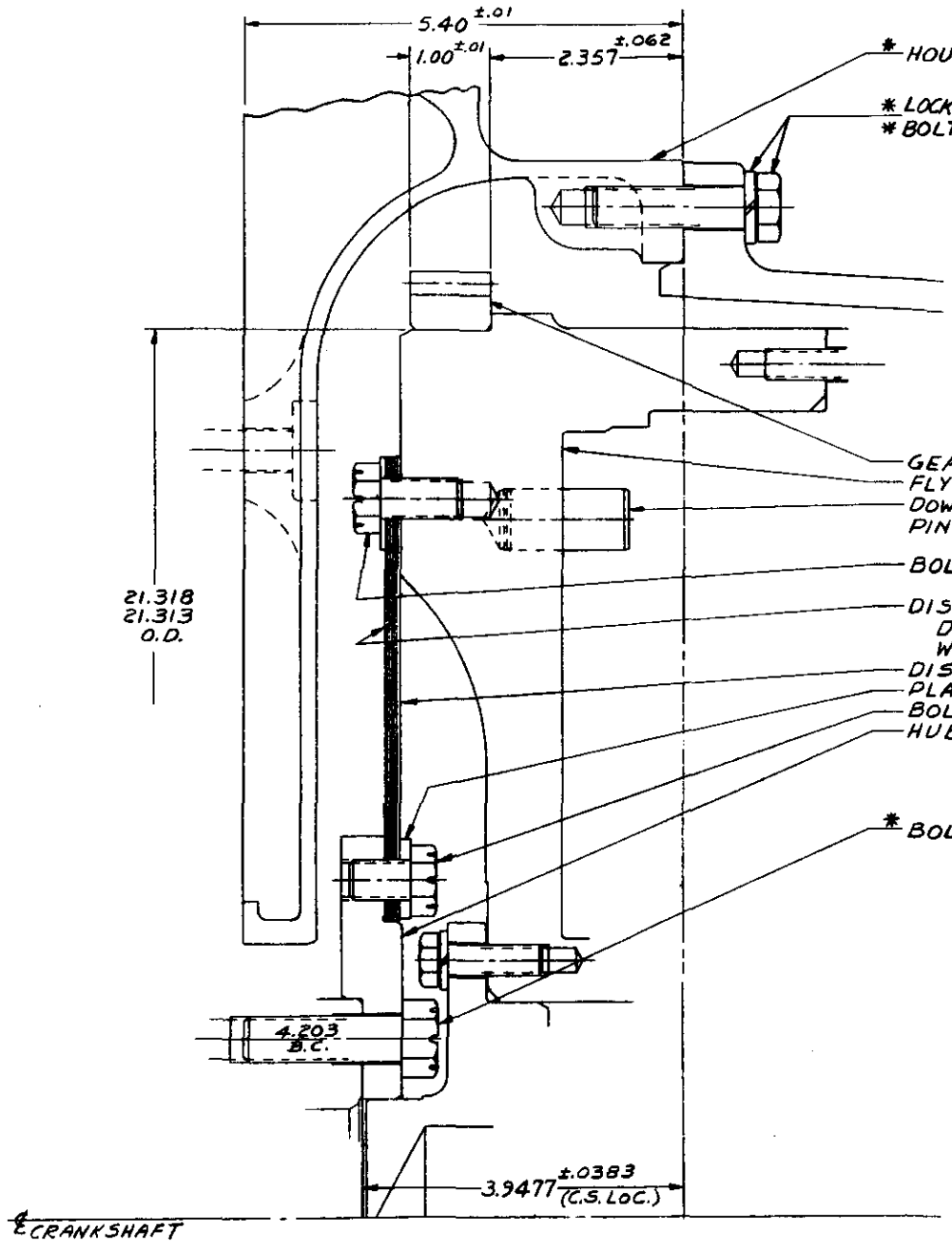
Allison TORQMATIC Drives

TITLE: DETROIT DIESEL 16V-71 AND 8V92 PHYSICAL ADAPTATION

MODEL: TC-800 & 900 CONVERTER

AS04-046

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



* HOUSING - 5111256

* LOCKWASHER - 103323 (12)

* BOLT - 186646 (12)

GEAR - ITEM "C"
FLYWHEEL - ITEM "B"
DOWEL - ITEM "D" (2)
PIN - ITEM "E"
— FLYWHEEL ASSEM. - ITEM "A"

BOLT - 9409058 (12)

DISC ASSEM. - 6751698
DISC - 6750529
WASHER - 6751521 (6)
DISC - 6750529 (5)
PLATE - 6750527
BOLT - 9409056 (8)
HUB - 6750574
— FLEX PLATE ASSEM. - 6752631

* BOLT - 9409532 (6)

ITEM	NO LOCK-UP CLUTCH OR START. GEAR	NO LOCK-UP CLUTCH. START. GEAR	LOCK-UP CLUTCH. NO START. GEAR	LOCK-UP CLUTCH & START. GEAR
A	—	6752079	6768606	6768604
B	6750182	6750182	6759577	6759577
C	—	5176711	—	5176711
D	—	—	125860	125860
E	—	—	6768590	6768590

ITEM	HYD. DUMP CLUTCH & START. GEAR
A	6768597
B	6768237
C	5176711
D	125860
E	6768590

AS04-047

BASIC INSTALLATION DWG. AS81-004

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS00-015

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

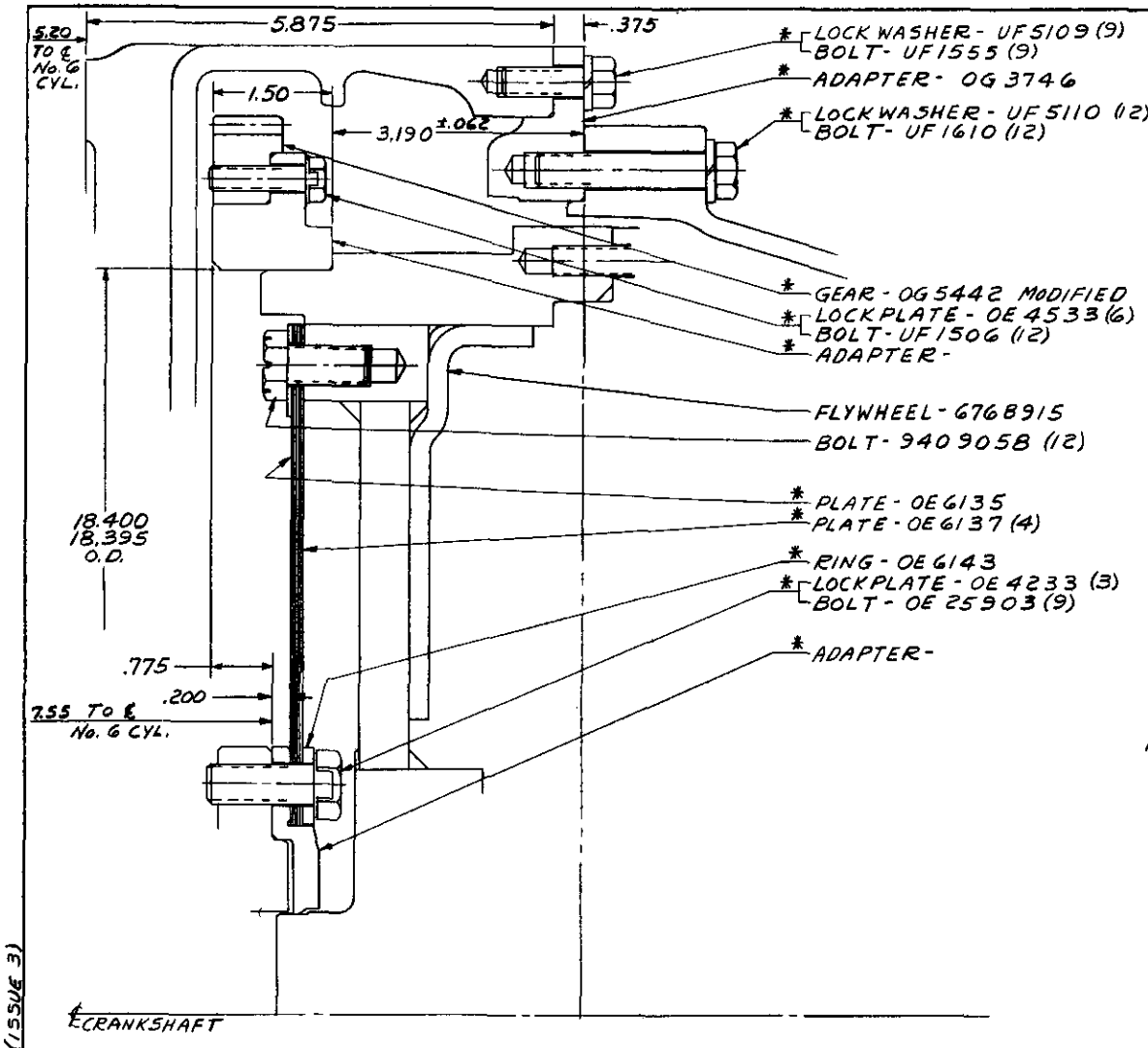
DRAWN SNEANY 6-14-62	CHECKED HIGGINS 7-6-62	ENG. APPROVAL R.T.S. 7-12-62
SCALE FULL	PROJ. ENGR. ST. JOHN 7-11-62	SUPV. ENGR. E. WELCHER 7-11-62

GM GENERAL MOTORS — Allison TORQMATIC Drives

TITLE: DETROIT DIESEL 6-110 PHYSICAL ADAPT.

MODEL TC-800 & 900 CONVERTER — AS04-047

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA



NOTE: LOCK-UP OPTION CAN NOT BE PROVIDED WITH THIS CONFIGURATION. AS04-048

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS00-001.

BASIC INSTALLATION DWG. AS 51-003.

*DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

DRAWN SWEANY 6-26-62	CHECKED HUGGINS 4-2-63	ENG. APPR. BTS +-3-63	
SCALE FULL	PROJ. ENGR. ST JOHN 5-11-62	APPL. ENGR. WELCHER 5-11-62	

GM GENERAL MOTORS

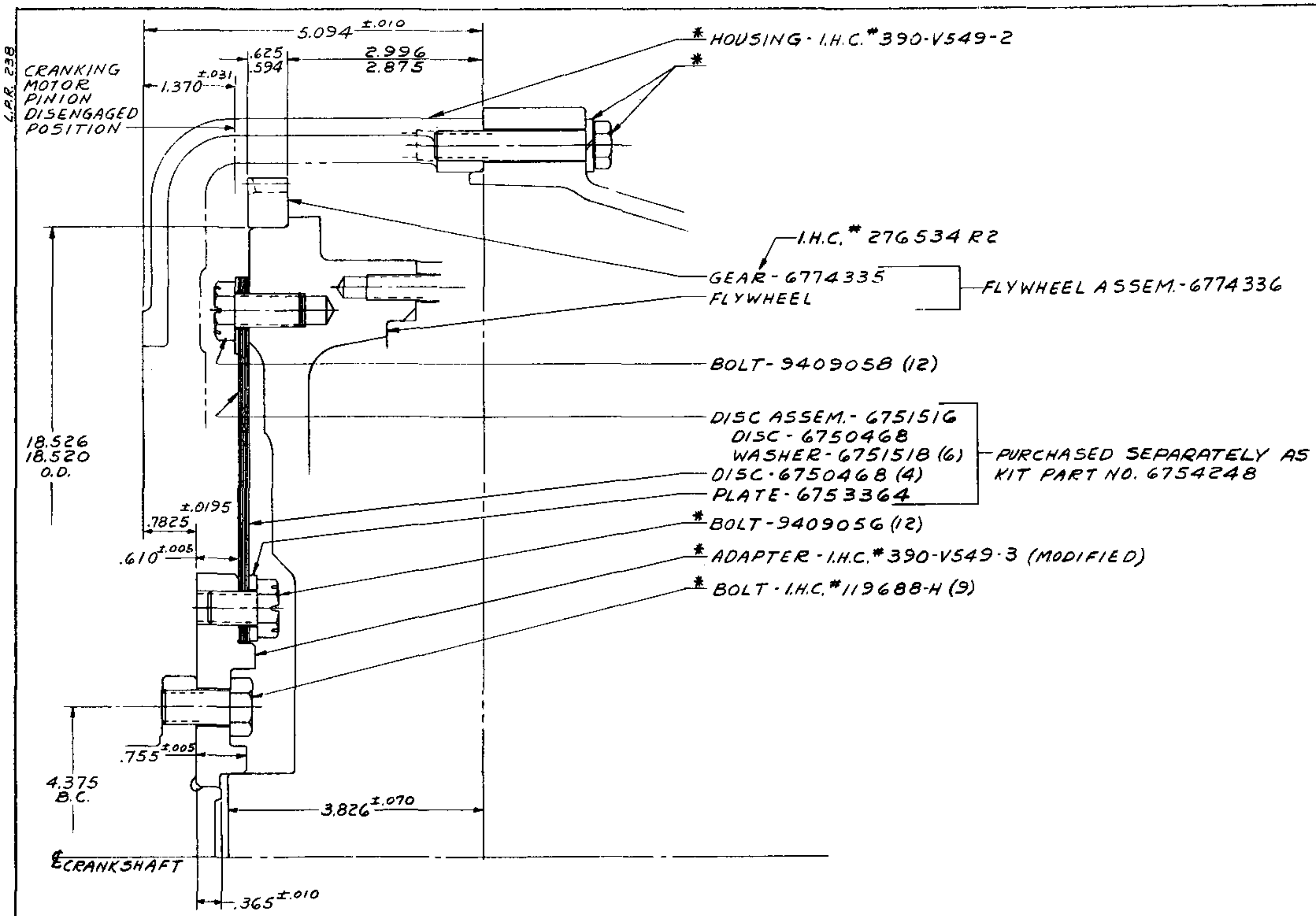
Allison TORQMATIC Drives

TITLE: ROLLS-ROYCE "C6S" PHYSICAL ADAPT.

MODEL TC-500 AS04-048

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA

REF. ROLLS-ROYCE #OL 2422 (ISSUE 3)


5.094 ±.010
.625
.594
2.996
2.875
CRANKING MOTOR PINION DISENGAGED POSITION
1.370 ±.031
* HOUSING - I.H.C. # 390-V549-2
*
I.H.C. # 276534 R2
GEAR - 6774335
FLYWHEEL
FLYWHEEL ASSEM. - 6774336
BOLT - 9409058 (12)
DISC ASSEM. - 6751516
DISC - 6750468
WASHER - 6751518 (6)
DISC - 6750468 (4)
PLATE - 6753364
PURCHASED SEPARATELY AS KIT PART NO. 6754248
18.526
18.520
O.D.
±.0195
.7825
.610 ±.005
* BOLT - 9409056 (12)
* ADAPTER - I.H.C. # 390-V549-3 (MODIFIED)
* BOLT - I.H.C. # 119688-H (9)
.755 ±.005
4.375
B.C.
3.826 ±.070
℄ CRANKSHAFT
.365 ±.010

C.P.R. 238

AS 04-049

FOR CONVERTER DRIVE DATA NOT SHOWN SEE AS 00-001

BASIC INSTALLATION DWG. AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

REF. I.H.C. # 390-V549-1

CHANGES		
J		
H		
G		
F		
E		
D		
C		
B		
A	9-8-78	FLYWHEEL WAS FLYWHEEL 6774337

GM GENERAL MOTORS

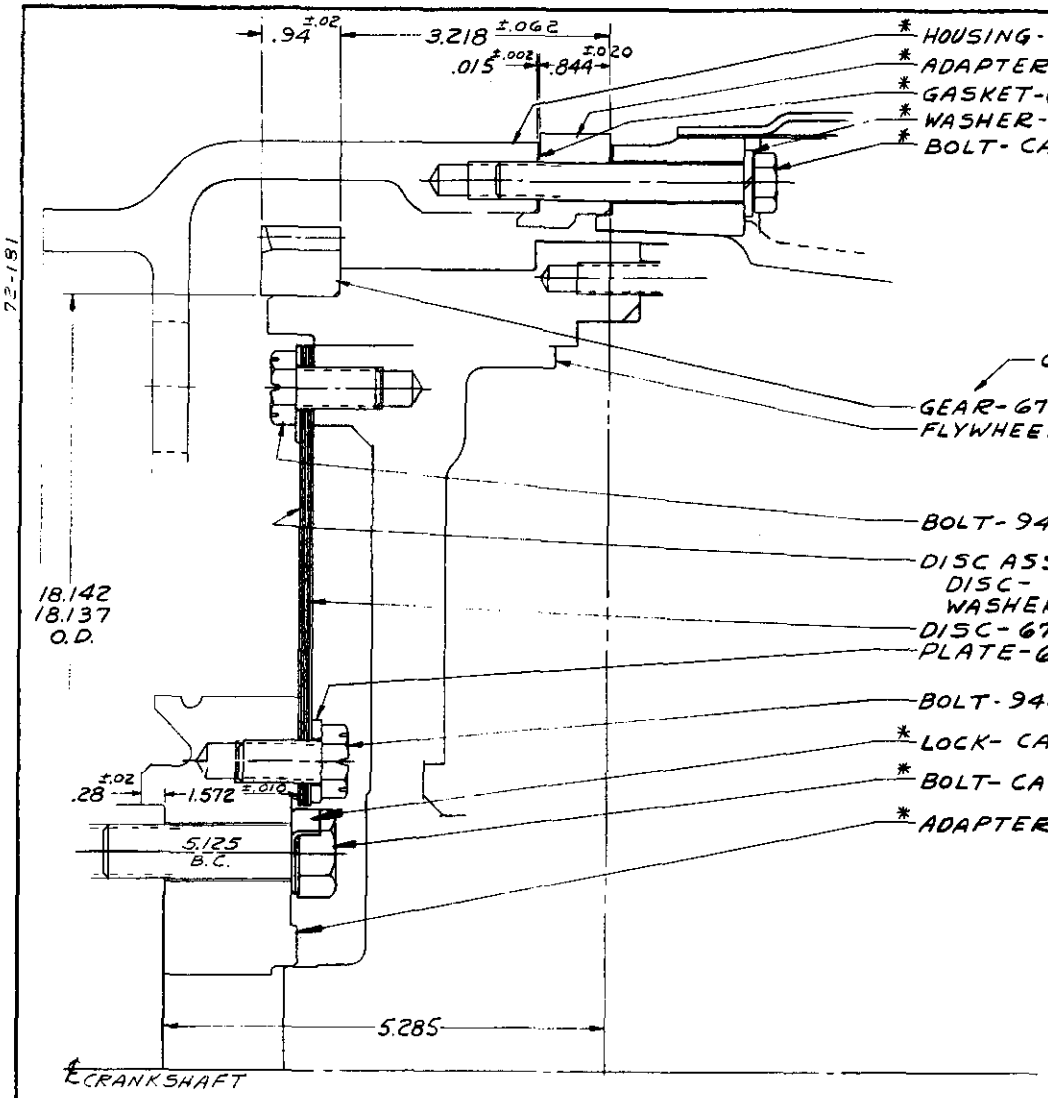
Allison TORQMATIC Drives

DRAWN	CHECKED	CHF. DRAFTSMAN
SWEANY 8-21-62	HIGGINS 5-8-63	PTS 5-8-63
SCALE FULL	PROJ. ENGR. ST JOHN 9-10-62	APPL. ENGR. WELCHER 9-11-62

TITLE: INTERNATIONAL HARVESTER "UV549" PHYSICAL ADAPT.

MODEL TC-400 AS 04-049

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



* HOUSING - CAT. NO. 6L5877
* ADAPTER - CAT. NO. 1H3515
* GASKET - (2) G.M. No. 5181902
* WASHER - CAT. NO. 3B4507
* BOLT - CAT. NO. 4F5192

CAT. NO. 5L2751 (FOR ELEC. STARTER)

GEAR - 6773504
FLYWHEEL - 6769997
— FLYWHEEL ASSEM. - 6773507

BOLT - 9409058 (12)

DISC ASSEM. - 6751516
DISC - 6750468
WASHER - 6751518 (6)

DISC - 6750468 (4)

PLATE - 6753364

BOLT - 9409058 (12)

* LOCK - CAT. NO. 9L3524

* BOLT - CAT. NO. 51577 (9) 5/8-18 × 2 1/4

* ADAPTER - CAT. NO. 9L3521

AS04-051

THIS DRAWING APPLIES ONLY TO CATERPILLAR D333 AND 1673 ENGINES IN THE FOLLOWING SERIAL NUMBER SERIES:

D333	1673
7981 AND UP	7081 AND UP
588312 AND UP	7881 AND UP
8781 AND UP	
66D1 TO 66D1929	
23C1 TO 23C321	

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY. AVAILABILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND ENGINE MFR.

FOR TRANSMISSION DRIVE DATA NOT SHOWN SEE DWG. AS00-001

* DENOTES PARTS NOT SUPPLIED WITH TRANSMISSION ASSEMBLY

CHANGES			
J			
H			
G			
F			
E			
D			
C			
B	1-11-74	ADDED SERIAL NO. NOTE D	H
A	10-2-67	SEE REV. NOTICE	SG

DRAWN	CHECKED	CHK. ENGR. APPR.
SWEANY	HIGGINS	B.T.S
6-25-63	9-17-63	9-17-63
SCALE	PROJ. ENGR.	APPL. ENGR.
FULL	ROBINSON 7-9-63	WELCHER 7-9-63

GM GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: CATERPILLAR "1673 & D-333" PHYSICAL ADAPT.

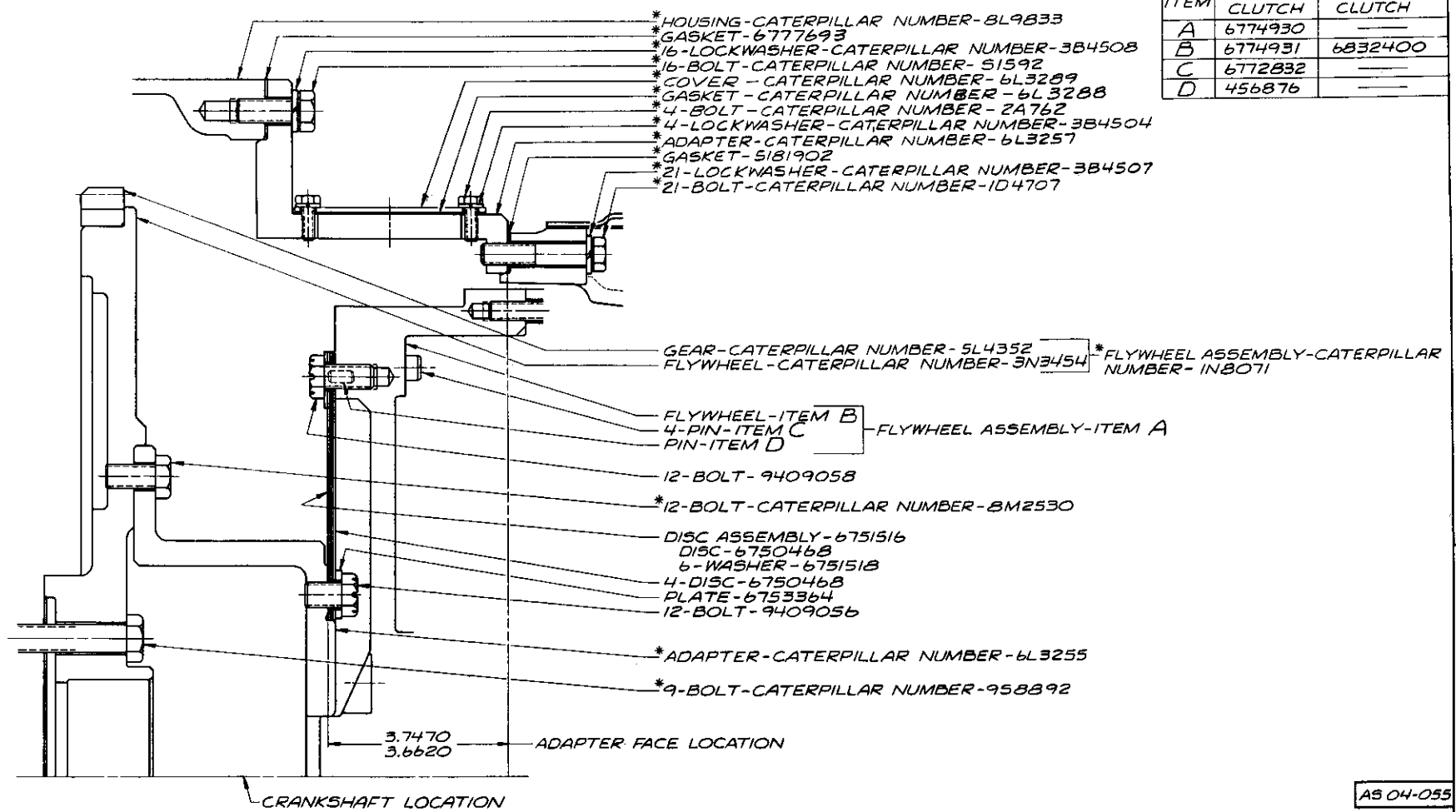
MODEL CT-5000 SERIES TRANSMISSION | AS04-051

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA

REF. AS 04-029

72-181

ITEM	LOCKUP CLUTCH	NO LOCKUP CLUTCH
A	6774930	——
B	6774931	6832400
C	6772832	——
D	456876	——



AS 04-055

ENGINE FLYWHEEL HOUSING EXTERNAL DRAIN LINE REQUIRED
FOR INFORMATION, CONTACT THE ALLISON TRANSMISSION APPLICATIONS ENGINEERING DEPARTMENT

THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY
AVAILABILITY OF PARTS MUST BE OBTAINED FROM DETROIT DIESEL ALLISON SALES AND THE ENGINE MANUFACTURER

FOR ENGINES FROM 62B1 THRU 62B3643 USE FLYWHEEL GROUP 6L3256 AND FLYWHEEL HOUSING 4L3791

FOR TRANSMISSION DRIVE DATA NOT SHOWN SEE DRAWING—AS 00-001

* DENOTES PARTS NOT SUPPLIED WITH TRANSMISSION ASSEMBLY

FOR TRANSMISSION INSTALLATION DATA NOT SHOWN SEE BASIC INSTALLATION DRAWING—AS 58-029 FOR 5860, 5960, AND 6061
AS 58-031 FOR 5860 AND 5960

CHANGES				
F	1-21-74	ADDED ACCESS COVER PART NO.	BJL	
E	12-3-73	REVISED AND REDRAWN ADD FLYWHEEL & BOLTS	RWL	

DRAWN	CHECKED	CHF DRAFTSMAN
SWEANY	E.R.O	BETHER
10-29-64	11-10-64	11-10-64
SCALE	PROJ. ENGR.	APP. ENGR.
FULL		DR/EN 11-3-64

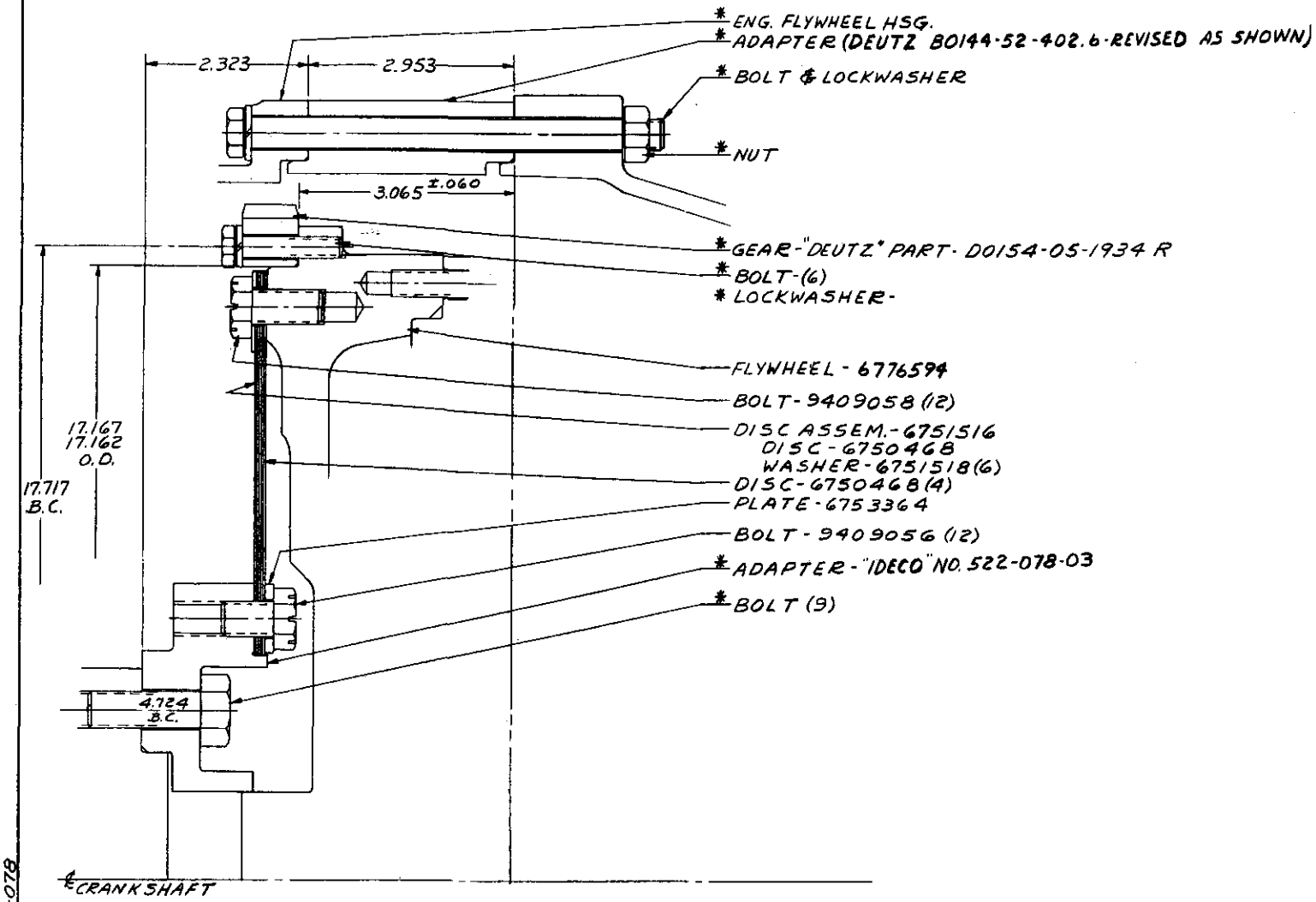
Allison Transmissions

TITLE: CATERPILLAR D 343 PHYSICAL ADAPTATION

MODEL CLBT-5860 | AS 04-055

Detroit Diesel Allison Division of General Motors · Indianapolis, Indiana

FORM 8202 S



AS04-064

NOTE: THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY PARTS AVAILABILITY MUST BE OBTAINED FROM ALLISON SALES AND THE ENGINE MFR.

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS00-001

BASIC INSTALLATION DWG. AS51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

REF. "IDECO" LAYOUT # 4-522-078

CHANGE				
J				
H				
G				
F				
E				
D				
C				
B				
A	11-16-65	SEE REV. AS04-064 ON FILE		

DRAWN	CHECKED	ENG. APPROVAL
SWEANY 10-10-63	HARPER 12-18-63	DJS 12-19-63
SCALE FULL	PROJ. ENGR. ROBINSON 11-11-63	APPL. ENGR.

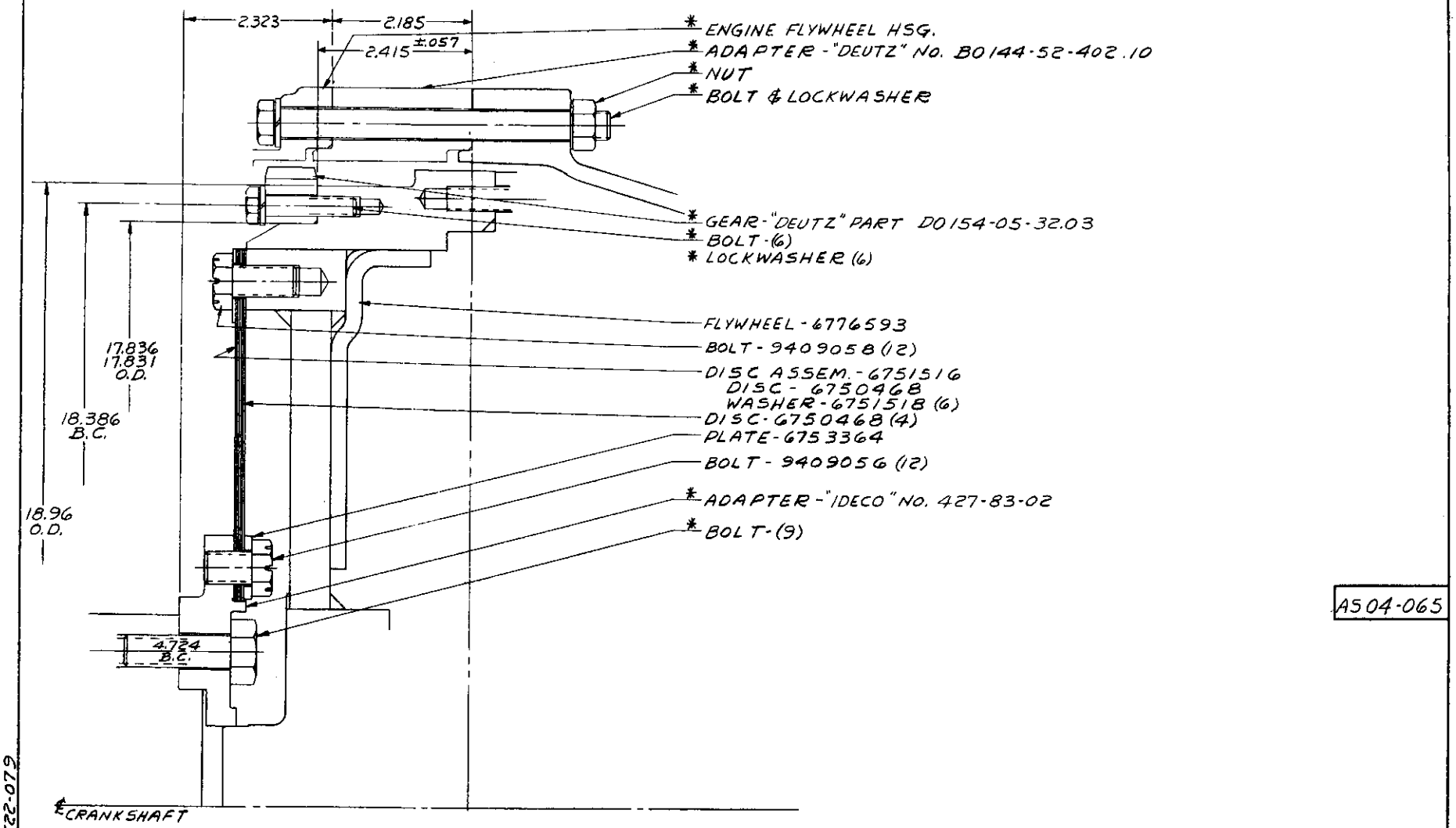
GM GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: DEUTZ "F8L 714" PHYSICAL ADAPT.

MODEL TC-400 AS04-064

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA



AS04-065

REF. "IDECO" LAYOUT # 4-522-079

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

BASIC INSTALLATION DWG. AS 51-003

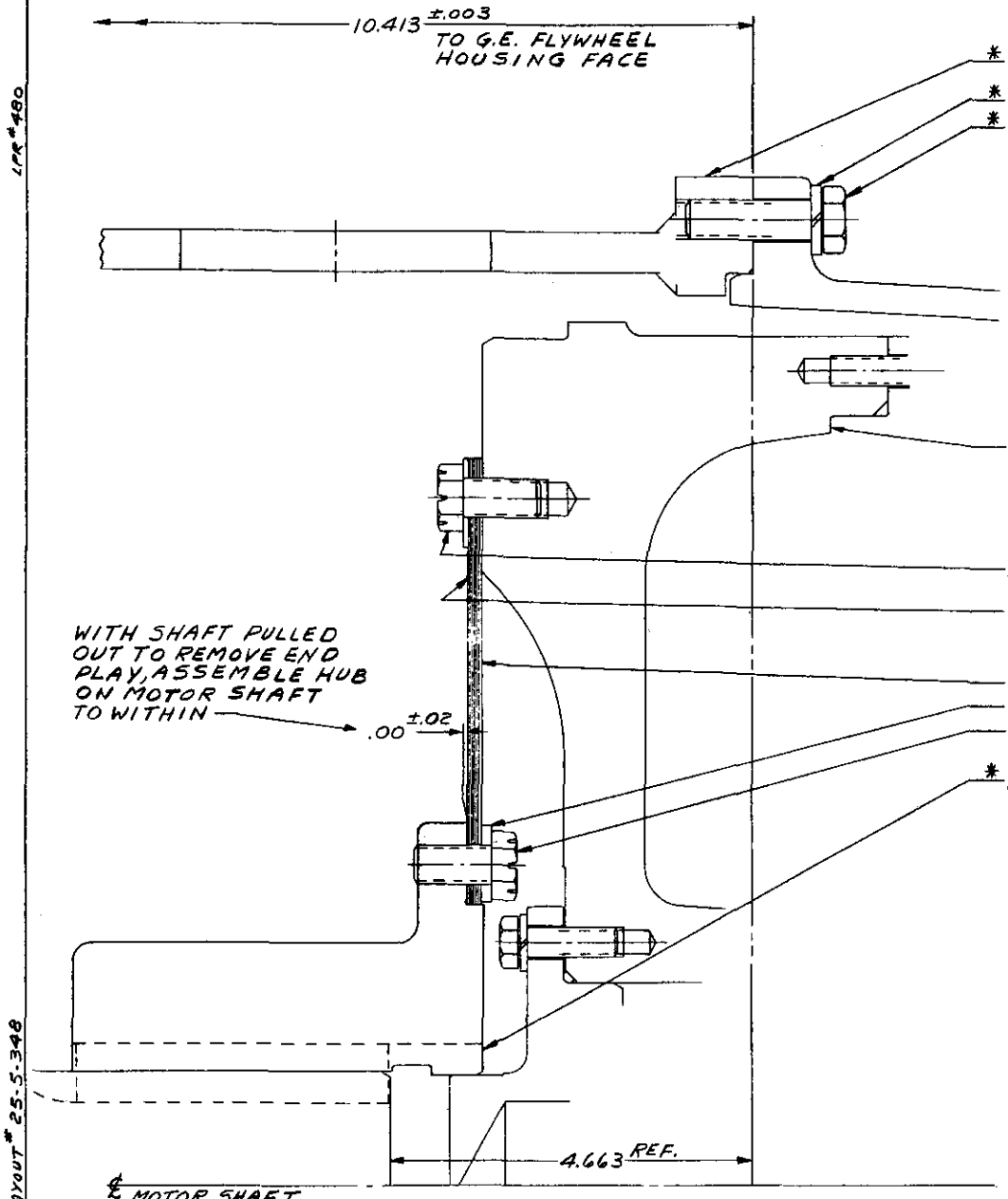
*DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

DRAWN SNEANY 10-11-63	DESIGNED HARPER 11-18-63	SUP. MANAGER RTS 12-19-63	GM GENERAL MOTORS
SCALE FULL	PROJ. ENGR. Robinson 11-11-63	APPL. ENGR.	Allison TORQMATIC Drives

TITLE: DEUTZ "F12L 714" PHYSICAL ADAPT.

MODEL TC-500 AS04-065

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



AS04-072

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-015

BASIC INSTALLATION DWG. AS81-004

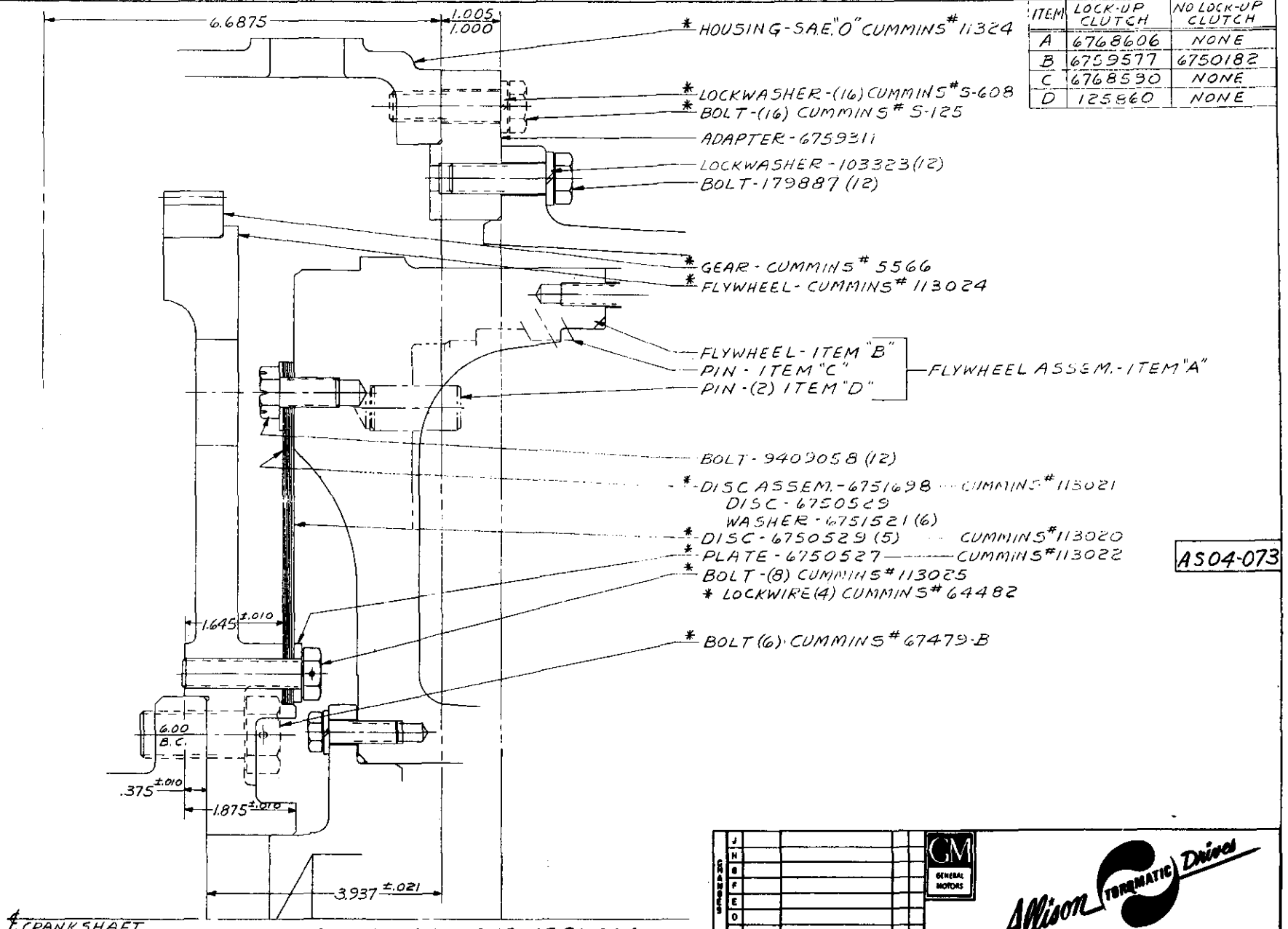
*DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

LPR #480

REF. G.E. LAYOUT # 25-5-348

DESIGN SWEANY 10-29-64	CHECKED HARPER 11-2-64	GM DIVISION Baston 12-3-64	TITLE: G.E. 350 H.P. MOTOR PHYSICAL ADAPT.
SCALE FULL	PROJ. ENGR. ROBINSON 11-26-64	APPL. ENGR. WELCHER 11-30-64	MODEL TC-800 & 900 CONVERTER — AS04-072

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



ITEM	LOCK-UP CLUTCH	NO LOCK-UP CLUTCH
A	6768606	NONE
B	6759577	6750182
C	6768590	NONE
D	125860	NONE

AS04-073

BASIC INSTALLATION DWG. AS81-004

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS00-015

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

REF. CUMMINS # 113054

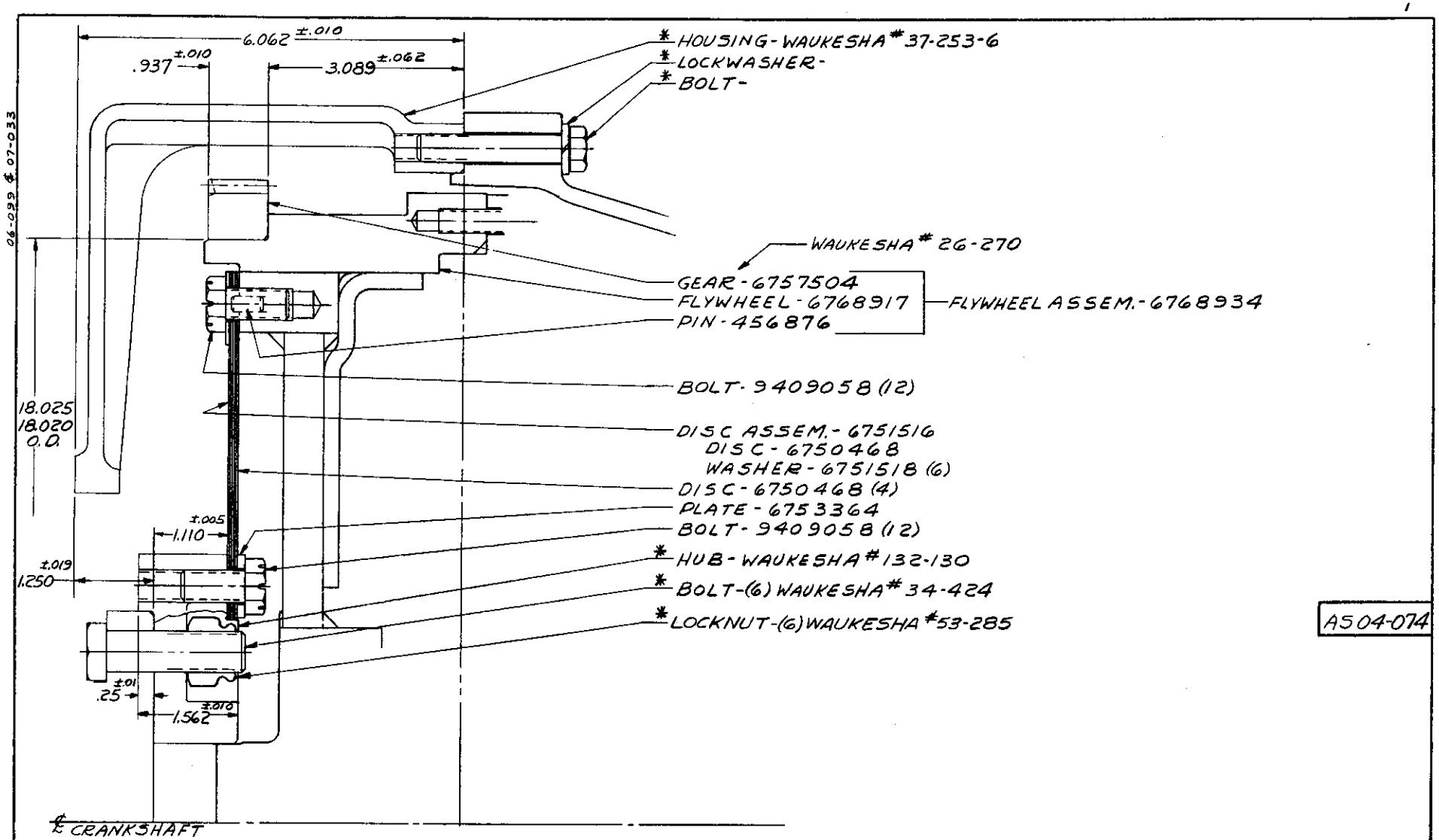
06-011 6088 07-026 04-059

DRAWN SWEAN 7-14-64	CHECKED	ENGR. APPR. R.J.B. 8-4-64	
SCALE FULL	PROJ. ENGR. 2.0 Rev 50 7-28-69	APPL. ENGR. E.W. 7-28-64	

TITLE: CUMMINS "NVH" PHYSICAL ADAPT.

MODEL 800 & 900 SERIES CONVERTER AS04-073

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA



AS04-074

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY. AVAILABILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND ENGINE MANUFACTURER

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

BASIC INSTALLATION DWG. AS51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY.

SWEANY 6-25-64	ELH 7-2-64	R.T.S. 8-10-64
FULL	E.W. 6-24-64	ROBINSON 6-25-64

GENERAL MOTORS

Allison TORQMATIC Drives

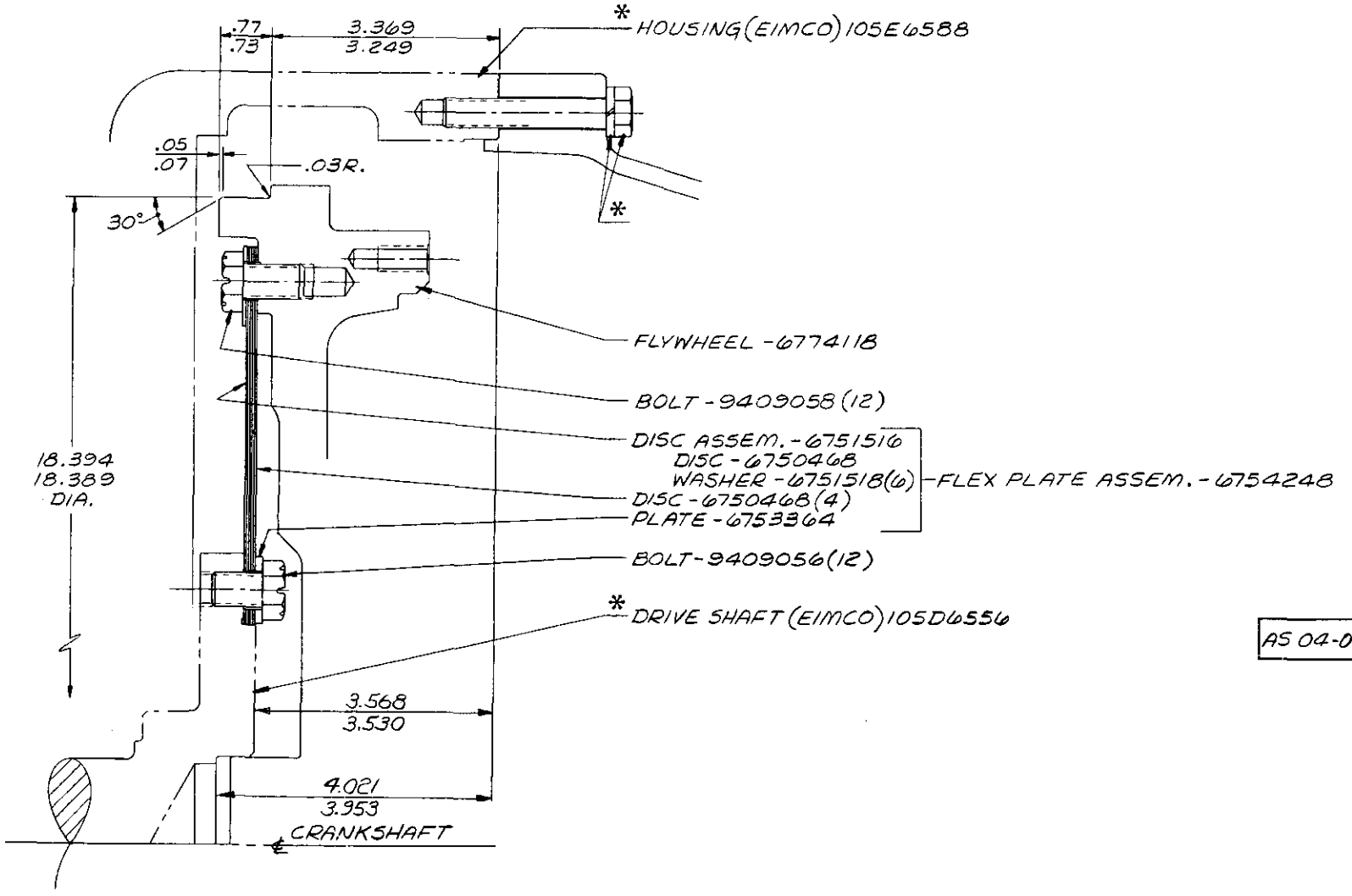
TITLE: WAUKESHA "H-844" PHYSICAL ADAPT.

MODEL TC-500 AS04-074

ALLISON DIVISION • GENERAL MOTORS CORPORATION • INDIANAPOLIS, INDIANA •

REF. AS04-010

06-099 & 07-033



AS 04-076

FOR CONVERTER DRIVE DATA
NOT SHOWN SEE AS 00-001

BASIC INSTALLATION DRAWING AS 51-003

*DENOTES PARTS NOT SUPPLIED
WITH CONVERTER ASSEMBLY.

NOTE:
THIS DRAWING ILLUSTRATES
DESIGN STATUS ONLY.
AVAILABILITY OF PARTS MUST BE OBTAINED
FROM ALLISON SALES AND ENGINE MFG.

CHANGES J H G F E D C B A			
C. DRAWN HUGHES 8-21-60	CHK. GRD. E.R.D. 11-9-64	CHK. DRAFTSMAN E.T.L. 11-10-64	GM GENERAL MOTORS
CHG	SCALE FULL	PROJ. ENGR.	APPL. ENGR. D.R./E.W. 5-17-64

Allison TORQMATIC Drives

TITLE: EIMCO 115 EXCAVATOR - ELECTRIC DRIVE PHYSICAL ADAPTION

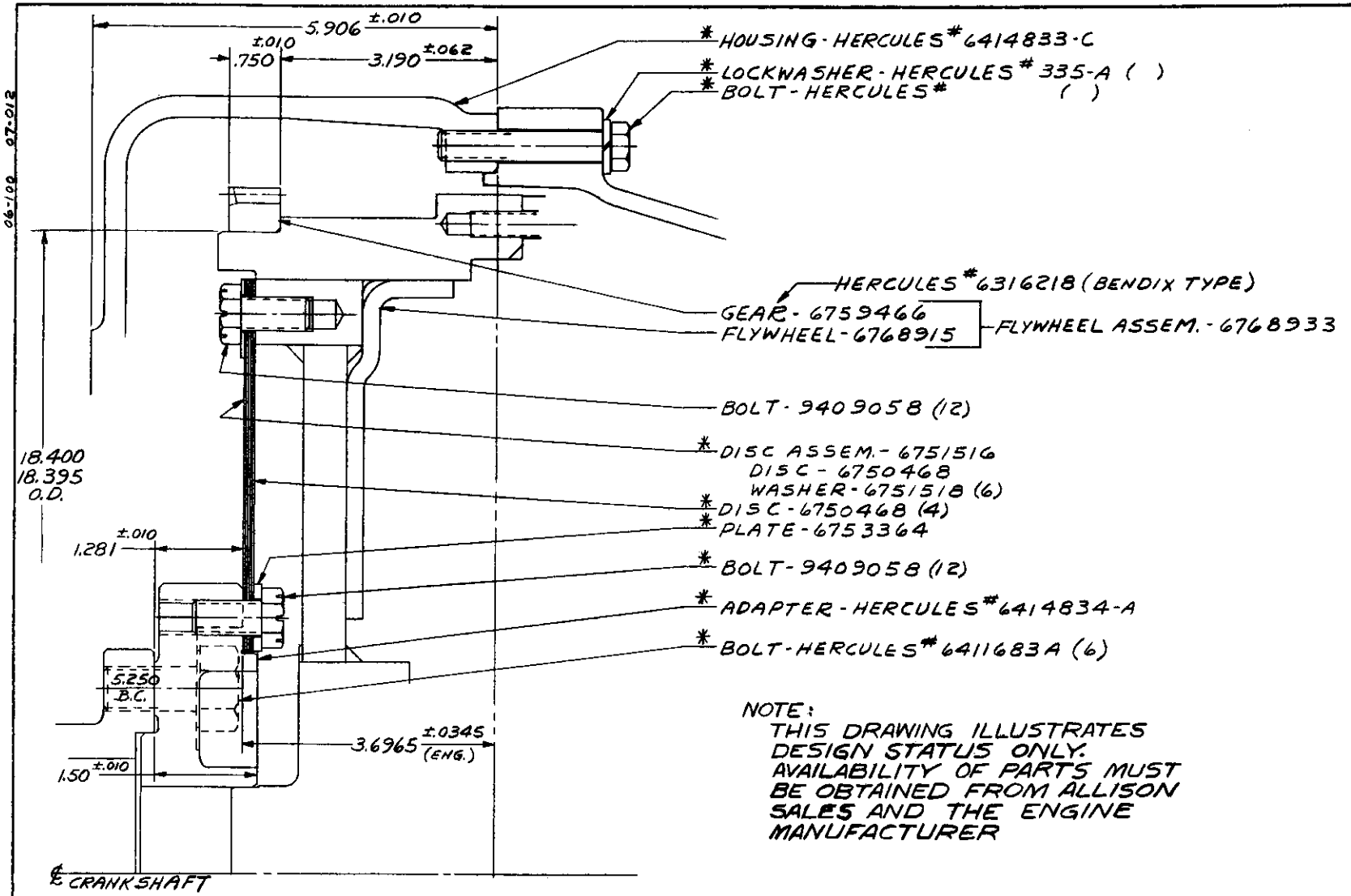
MODEL TC-400 AS 04-076

ALLISON DIVISION-GENERAL MOTORS CORPORATION-INDIANAPOLIS, INDIANA

ALLISON DIVISION
GENERAL MOTORS CORPORATION

REF. AS 04-043

FORM 1048-C REV 8-65



AS04-077

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY. AVAILABILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND THE ENGINE MANUFACTURER

FOR CONVERTER DRIVE DATA NOT SHOWN SEE AS00-001

BASIC INSTALLATION DRAWING AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY

DRAWN SWEANY 7-13-64	CHECKED HIGGINS // APRIL 68	ENGR. APPROVAL	
SCALE FULL	PROJ. ENGR. ROBINSON // APRIL 68	APPL. ENGR. E.W. // APRIL 68	

CHANGE LETTERS: J H G F E D C B A

GM GENERAL MOTORS

Allison TORQMATIC Drives

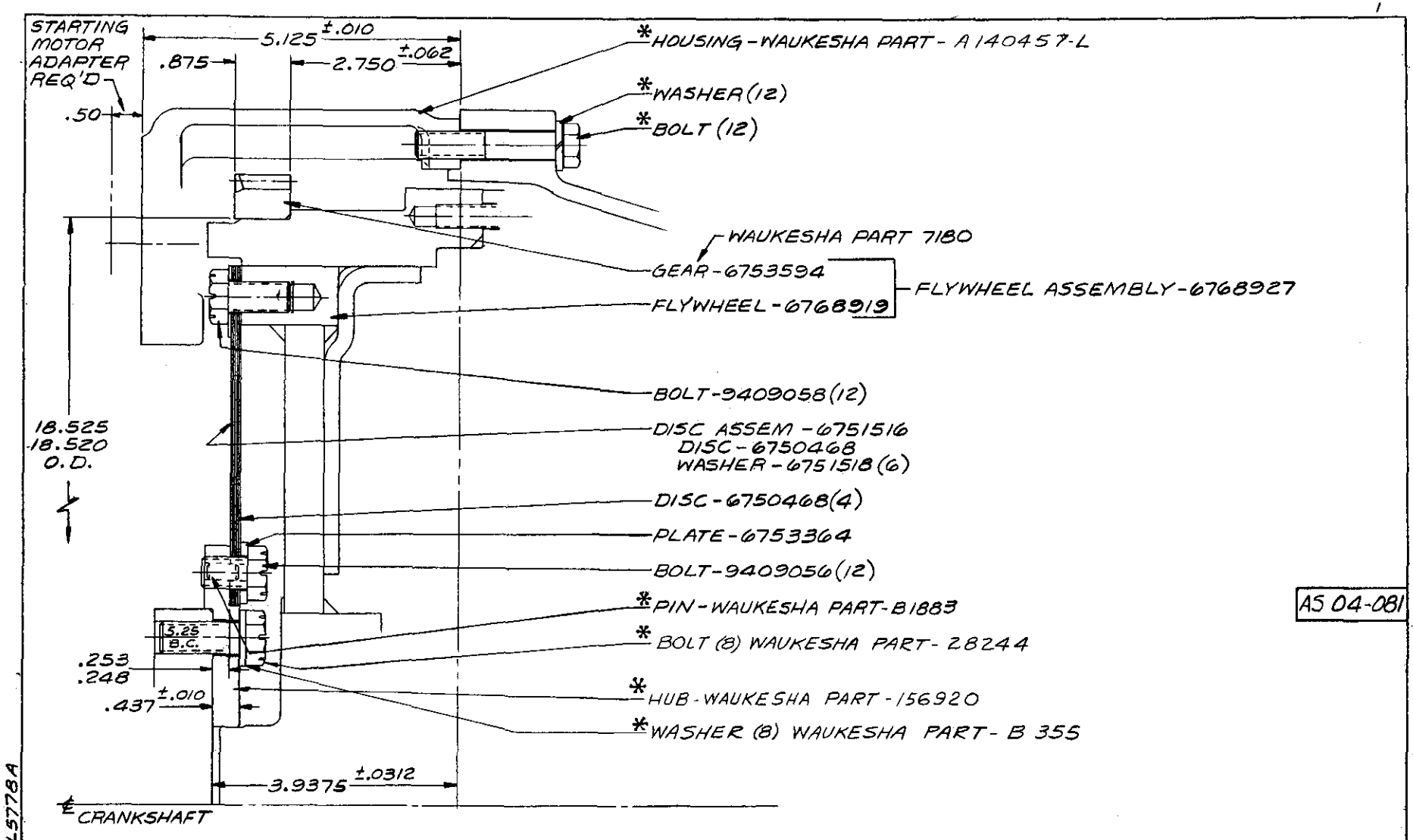
TITLE: HERCULES "HS6182" PHYSICAL ADAPT.

MODEL TC-500 AS04-077

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA ·

REF. AS04-050

06-100 07-012



AS 04-081

BASIC INSTALLATION DRAWING
AS 51-003

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY. AVAILABILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND ENGINE MFR.

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DRAWING AS 00-001

*DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY

SEE WAUKESHA LAYOUT L5778A

DRAWN Hughes 8-17-65	CHECKED S. HARPER 5-24-65	ENGR. APPROVAL Erwin 5-25-65	
SCALE FULL	PROJ. ENGR. Robinson 5-18-65	APPL. ENGR. E. WELCHER 5-18-65	

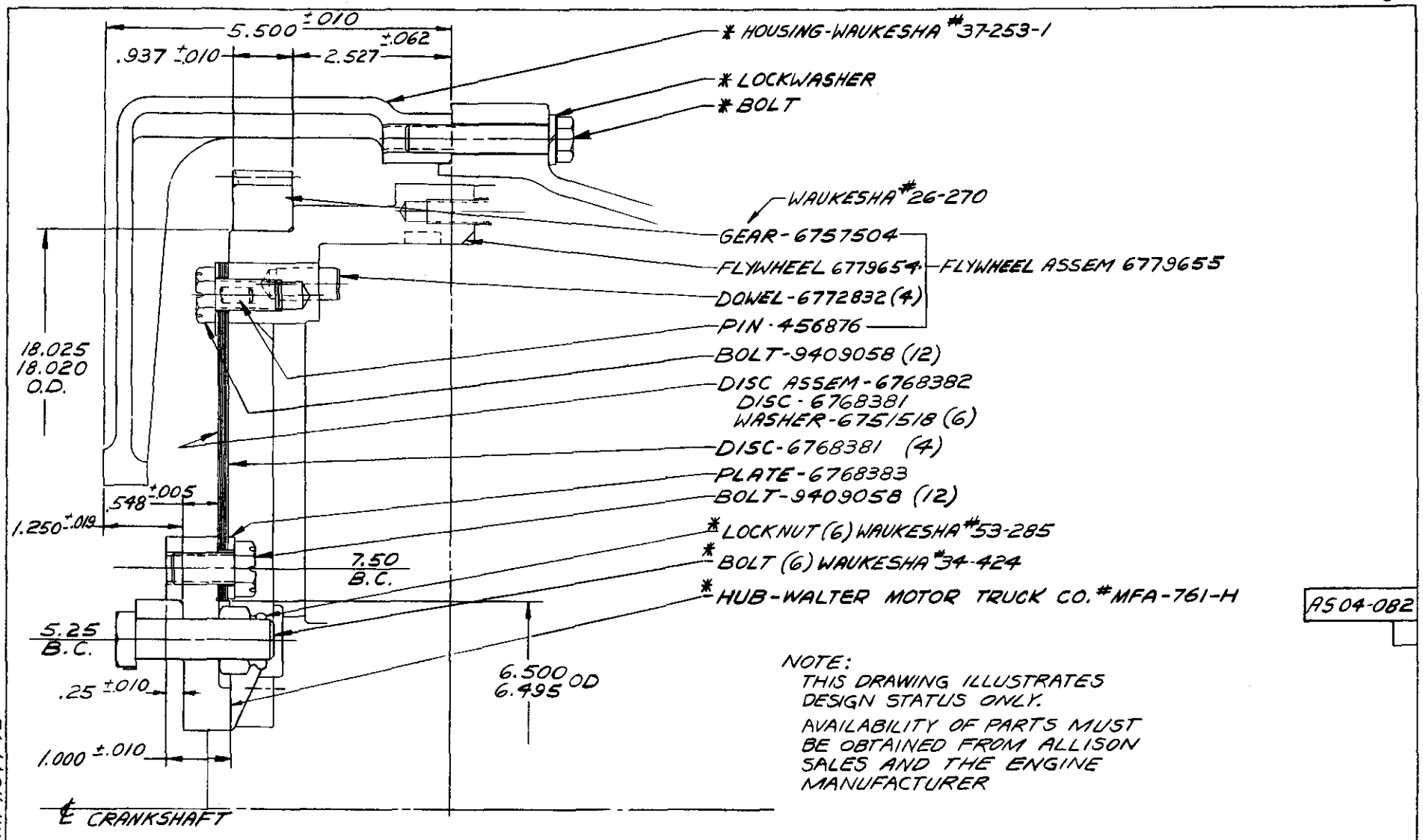
GM GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: WAUKESHA "F817GU" (145-GZ) PHYSICAL ADAPTATION

MODEL TC-500 AS 04-081

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



AS04-082

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY.
AVAILABILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND THE ENGINE MANUFACTURER

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG. AS 00-001

BASIC INSTALLATION DWG. AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY

REF. AS04-074 & WAUKESHA #8844-72

DRAWN	DESIGNED	APPROVED	
NE CASE 6-22-65	A.S. HARPER 8-20-65	Gilbert 8-20-65	
SCALE	FINAL WORK	APPL. ENGR.	
FULL	ROBINSON 8-5-65		

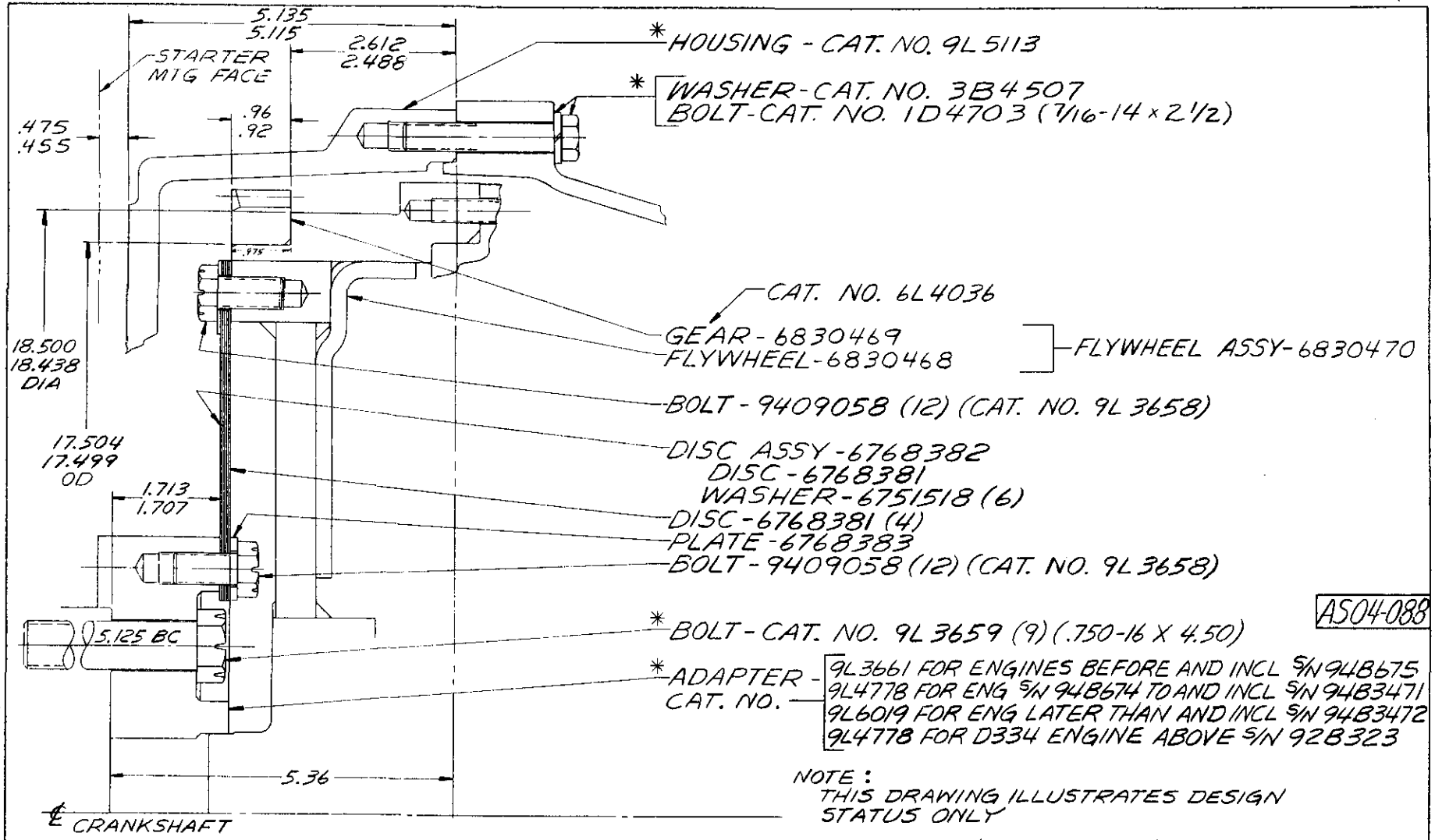
GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: WALTER MOTOR TRUCK REPOWER WAUKESHA "TH-884" PHYSICAL ADAPT.

MODEL TCL-500 AS04-082

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



AS04-088

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY

AVAILABILITY OF PARTS MUST BE OBTAINED FROM ALLISON SALES AND THE ENGINE MFR

BASIC INSTALLATION DWG AS 51-003

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DWG AS 00-001

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY

LTR	DATE	DESCRIPTION	BY	CHK
J				
H				
G				
F				
E	8-9-73	CS ADAPT NOS. REV	PH	VM
D	7-26-71	SEE REV NOTICE	PH	KM
C	11-3-69	SEE REV NOTICE	DN	WC
B	6 MAR 69	SEE REV NOTICE	KS	DMC
A	2-2-66	SEE ENG. CHG NOTICE	LH	PR

DRAWN	CHECKED	ENGR. DEPARTMENT APPROVAL
HANCOCK 11-5-65	HAYWARD 11-23-65	11-24-65
SCALE FULL	PROJ. ENGR. ROBINSON 11-10-65	APPL. ENGR. WELCHER 11-10-65

GM GENERAL MOTORS

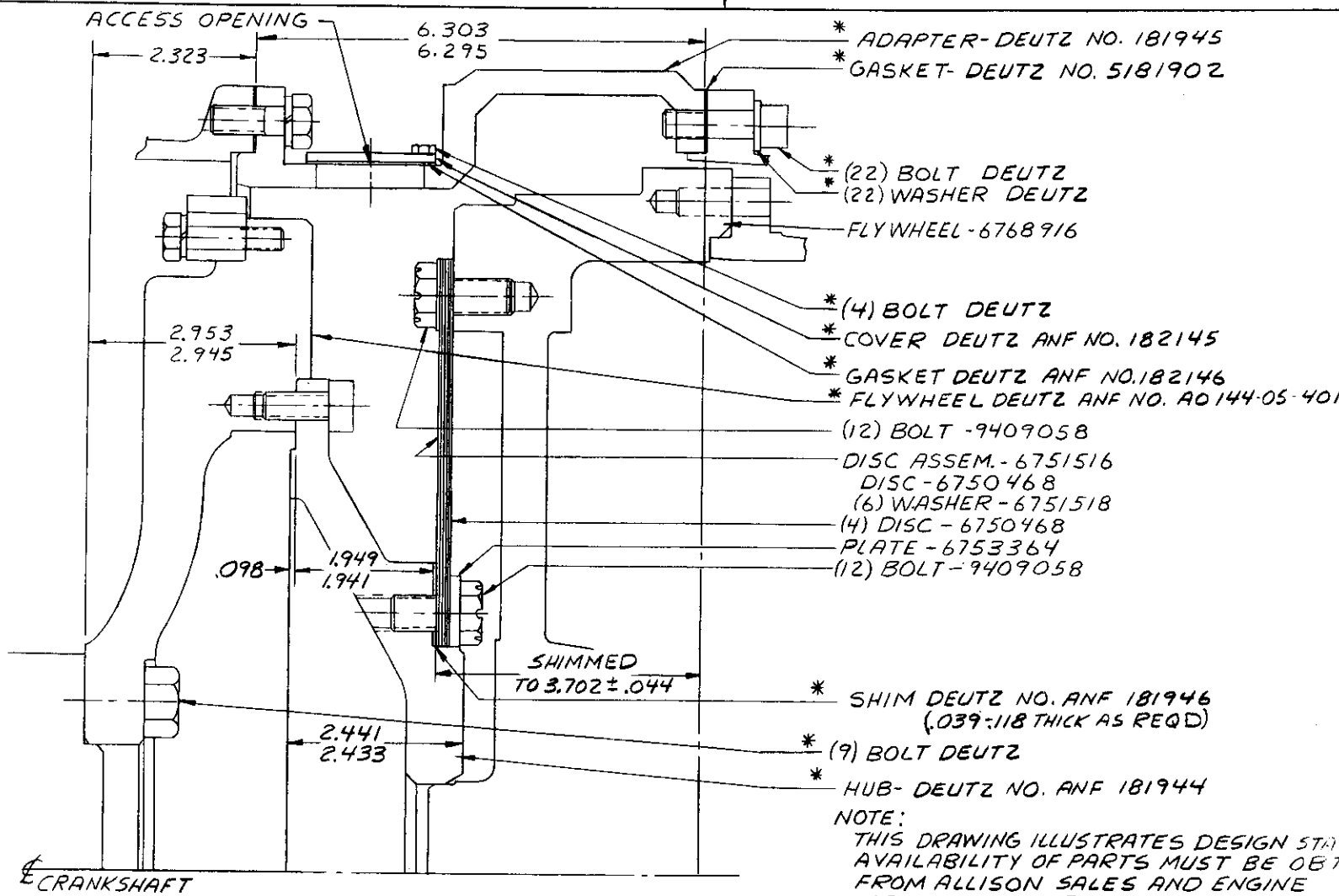
Allison TORQMATIC Drives

TITLE: CATERPILLAR 1674 D334 PHYSICAL ADAPTATION

MODEL TC-500 AS04-088

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA

REF CAT. NO. 40-73698-01-04



AS04-094

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY
AVAILABILITY OF PARTS MUST BE OBTAINED
FROM ALLISON SALES AND ENGINE
MANUFACTURER

BASIC INSTALLATION DWG. AS 56-003

FOR TRANSMISSION DRIVE DATA NOT
SHOWN SEE DWG. AS 00-001

* DENOTES PARTS NOT SUPPLIED
WITH TRANSMISSION ASSEMBLY

REF AS04-036 ANF*181943

CHANGES	
J	
H	
G	
F	
E	
D	
C	
B	
A	

DRAWN SHRAKE 7-22-66	CHECKED KING 16 Oct 68	CHF. DRAFTSMAN Pursley 17 Oct 68
SCALE FULL	PROJ. ENGR.	APPL. ENGR. CJALLISON 26 Aug 68

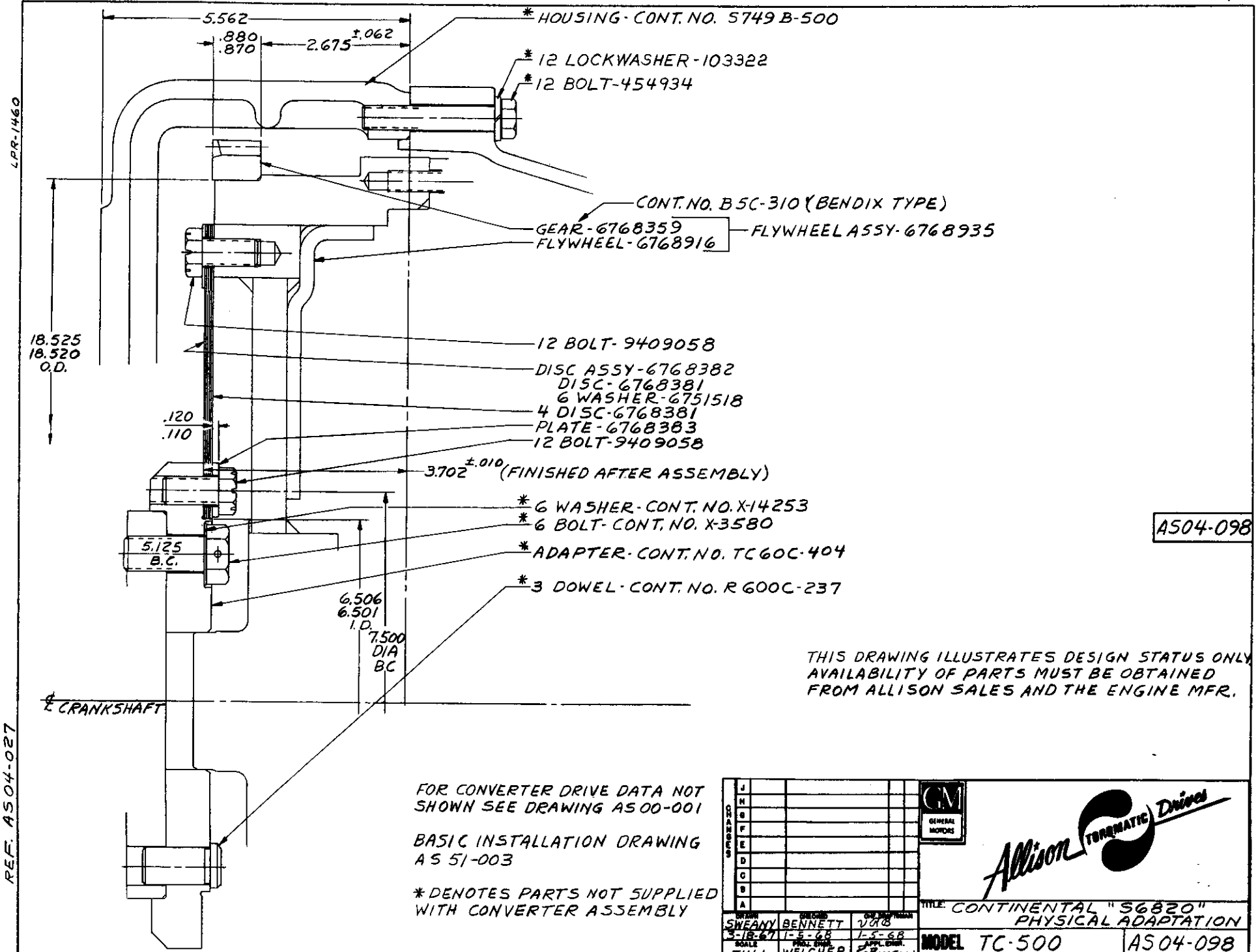
GM

Allison TORQMATIC® Drive

TITLE: DEUTZ F8L-714" PHYSICAL ADAPT.

MODEL CRT 5631 AS04-094

ALLISON DIVISION - GENERAL MOTORS CORPORATION - INDIANAPOLIS, INDIANA



AS04-098

THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY
AVAILABILITY OF PARTS MUST BE OBTAINED
FROM ALLISON SALES AND THE ENGINE MFR.

FOR CONVERTER DRIVE DATA NOT SHOWN SEE DRAWING AS00-001

BASIC INSTALLATION DRAWING AS 51-003

* DENOTES PARTS NOT SUPPLIED WITH CONVERTER ASSEMBLY

CHANGE LETTER	DRAWN	CHECKED	ORIG. APP. MGR.
J			
H			
G			
F			
E			
D			
C			
B			
A	SWEANY 3-18-67	BENNETT 1-5-68	VOB 1-5-68
SCALE	FULL	PROJ. ENGR. WELCHER 3-27-67	APPL. ENGR. ROBINSON 3-27-67

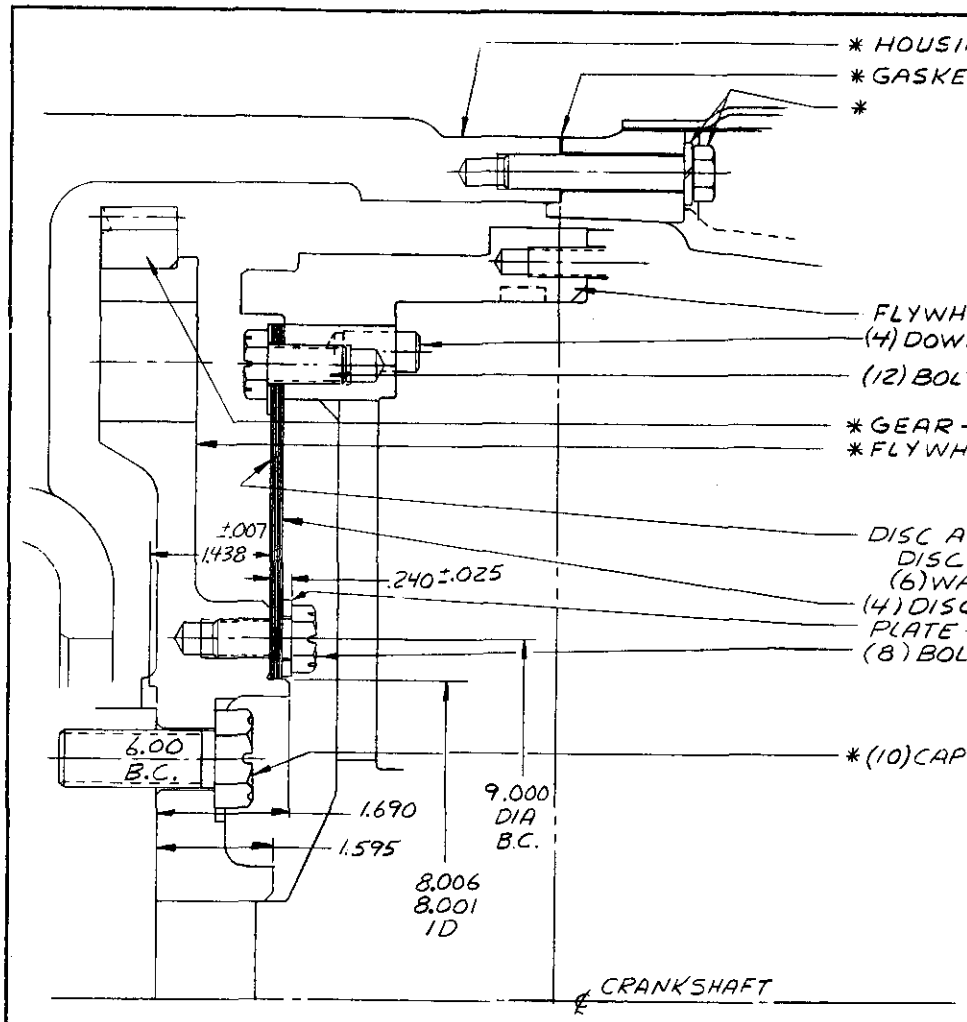
GM GENERAL MOTORS

Allison TORQMATIC Drives

TITLE: CONTINENTAL "S6820" PHYSICAL ADAPTATION

MODEL TC-500 | AS04-098

ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA



ITEM	LOCK UP CLUTCH	NO LOCK UP CLUTCH
A	6770911	—
B	6770891	6768918
C	6772832	—

AS 04-110

NOTE:
THIS DRAWING ILLUSTRATES DESIGN STATUS ONLY
AVAILABILITY OF PARTS MUST BE OBTAINED FROM DETROIT DIESEL ALLISON SALES AND THE ENGINE MFR

FOR TRANSMISSION DRIVE DATA NOT SHOWN SEE DRAWING AS 00-001

BASIC INSTALLATION DRAWING AS 58-029 OR AS 58-031

* DENOTES PARTS NOT SUPPLIED WITH TRANSMISSION ASSEMBLY

V	A	12/16	PART NO. 213052 WAS 67479-8, REM LOCKWIRE	D	E
DRAWN SNRAKE 21 OCT 68	CHECKED KING 7 NOV 68 PROJ. ENGR.	SYS. ENGR. DOCD 7 NOV 68 APPL. ENGR. GRAINGER 30 OCT 68	TITLE: CUMMINS V, VT, VTA 1710 (PHASE III) PHYSICAL ADAPTATION		
SCALE FULL			MODEL 5000-6000 SERIES AS 04-110		
			ALLISON DIVISION · GENERAL MOTORS CORPORATION · INDIANAPOLIS, INDIANA		

REF CUMMINS 196299, 199931