

GM SPORT COMPACT PERFORMANCE BUILD BOOK

Part Number 88958728

THIRD EDITION



4T65E Race Modified Transmission

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GM

RACING

INTRODUCTION

GENERAL INFORMATION

This handbook describes parts and procedures used to prepare **ECOTEC** race engines used by GM Racing in professional Sport Compact Drag Racing and Drifting, as well as engine, transmission, and chassis modifications designed for sportsman-level drag racers.

This handbook is intended to be used by experienced and knowledgeable race engine and chassis builders. It does not cover all basic engine blueprinting and assembly procedures, since it is assumed that the reader is already familiar with machining, measuring, and inspecting the components. Some of the procedures described require specialized tools and skills. If you do not have the appropriate training and equipment to perform these modifications safely, this work should be performed by other professionals.

There are, of course, many other possible combinations of components and modifications that may produce equal or superior results. However, by using the combination of parts and procedures described in this handbook, an experienced engine builder can build a competitive and reliable **ECOTEC** Race Engine.

It is not the intent of this book to replace the comprehensive and detailed service practices explained in the GM service manuals. GM service manuals are available from:

Helm Incorporated www.helminc.com
PO Box 07130
Detroit, MI 48207

Observe all safety precautions and warnings in the service manuals. Wear eye protection and appropriate protective clothing. When working under or around the vehicle support it securely with jack stands. Use only the proper tools. Exercise extreme caution when working with flammable, corrosive, and hazardous liquids and materials.

PROGRAM HISTORY

The General Motors Sport Compact Drag Racing Program was kicked off at the 2001 International Auto Salon (IAS) in Long Beach, CA. During IAS, GM identified Sport Compact Drag Racing as the highest opportunity to gain awareness in the sport compact market. The first Chevrolet Cavalier and Pontiac Sunfire front-wheel-drive drag race cars were unveiled at the 2001 SEMA show, and, in February of 2002, GM Racing made their competitive debut in Palmdale, CA. In 2003 and 2004 the GM Racing team won back-to-back championships in both the NHRA Hot Rod and ProFWD categories. In 2005, GM transitioned from a factory race team to factory support of independant teams.



Fig. 1

Gary Gardella earned the 2005 NDRA Pro 4 cylinder championship in his first year running an **ECOTEC** race engine. 2006 and 2007 brought more championships, records, and wins for Chevy and **ECOTEC**.

WHY WE RACE

At GM, we race because it's where we came from and because it fuels our love for competition.

Racing has been part of the GM culture since auto pioneers like Louis Chevrolet relied on speed records and racing victories to launch his fledgling car company. GM has remained in racing for two basic reasons - to win on the track and win in the marketplace.

Racing is a compelling demonstration of the depth of GM's technical resources, the capabilities of its people and the performance, reliability, quality and safety of its products. The race track is the toughest of proving grounds to forge engineering, marketing and business skills into tangible results. Few, if any, environments can match racing's ability to build awareness and consideration of a manufacturer's products to new customers, while simultaneously solidifying the loyalty of current customers.

FIVE PILLARS GUIDE GM RACING'S INTEGRATED STRATEGY

It provides a **dynamic training ground** for GM engineers. In racing, decisions must be made at a rapid rate. You must be ready at all times, on time, and solve problems quickly and effectively. Racing's demands are the perfect venue in which to exercise the mind and expand abilities, improve teamwork and communication - and do it all without making excuses.

This leads to **technology transfer**. Racing is well known to have introduced improvements in the auto production industry in areas such as suspensions, brakes, engines, aerodynamics and safety - but there's also a transfer in technology through people who work in racing, then take those improved skills and knowledge to the production process. Likewise, the advanced technology and people involved in the mass production of vehicles has enhanced the development of race cars.

Human nature dictates that **people want to compete** - and win. There is a strong competitive spirit within GM, and success in racing produces a vibrant esprit de corps. GM is not a sponsor of racing - we are an active, engaged participant who produces the cars and the components, and provides the technology essential to the sport.

If racing did not already exist, auto manufacturers would invent it as the **perfect marketing platform**. Racing is a sport that's all about the product and the people, followed with cult-like passionate fans who buy cars and trucks at a higher and more loyal rate than the average consumer.

Grass roots racers and enthusiasts demand the best, and have made **GM Performance Parts** the leader in over the counter components and engine assemblies. GM's

approach, as a participant in racing, is to take responsibility to support the sport. Someone else might even build a motor that beats the factory team. But it's this democratization of racing that sets GM apart, and is the cornerstone of GM's total business approach.

LEGAL INFORMATION

This publication is intended to provide technical information on the GM **ECOTEC** engines, Hydra-Matic transmission, and Chevy Cobalt used in sport compact drag racing at the professional and sportsman level.

This handbook pertains exclusively to engines and vehicles which are used off the public highways. Federal law restricts the removal or modification of any part of a federally required emission control system on motor vehicles. Further, many states have enacted laws which prohibit tampering with or modifying any required emission or noise control system. Vehicles which are not operated on public highways are generally exempt from most regulations, but the reader is strongly urged to check all applicable local and state laws.

Many of the parts described or listed in this handbook are merchandised for off-highway application only, and are tagged with the following "Special Parts Notice":

SPECIAL PARTS NOTICE

This part has been specifically designed for Off-Highway application *only*. Since the installation of this part may either impair your vehicle's emission control performance or be uncertified under current Motor Vehicle Safety Standards, it should not be installed in a vehicle used on any street or highway. Additionally, any such application could adversely affect the warranty coverage of such an on-street or highway vehicle.

The information contained in this handbook is subject to change. General Motors also reserves the right to make changes at any time, without notice, in equipment, manufacturers, specifications, and materials, or to discontinue items.

The information in this publication is presented without any warranty. *All the risk for its use is entirely assumed by the user.* Specific component design, mechanical procedures, and the qualifications of individual readers are beyond the control of the publisher, and therefore the publisher disclaims all liability incurred in connection with the use of information contained in this publication.

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ORDERING PARTS IN THIS BOOK

Parts described in this book are from several sources. Many parts are available from aftermarket suppliers. The contact information for these suppliers is listed in a separate section of this book. Note that some parts may be available from additional sources.

There are three types of General Motors parts listed in this book. First are parts used in regular production vehicles. These are regular service and replacement parts, denoted as 'GM' parts in this book. These parts are available through any GM dealer. See www.gmgoodwrench.com for more information and to locate a dealer near you.

The second type of GM parts shown are GM Performance Parts. These parts are available only through authorized GM Performance Parts dealers. Not all GM dealers are authorized to sell GM Performance Parts. For more information or to locate an authorized dealer, visit www.gmperformanceparts.com. Please note that not all parts are listed on the GM Performance Parts website. Your authorized dealer has a more complete list. If your dealer is an authorized GM Performance Parts dealer and still cannot locate a GM Performance Part listed in this book, please e-mail GM Racing through our website www.gmtunersource.com.

The third type of parts listed in this book are available exclusively from GM Racing. These are typically low-volume parts for professional racing applications. All GM Racing Parts are for off-highway use only and are tagged with the "Special Parts Notice" shown previously in this book. GM Racing Parts are available only by e-mailing us through our website www.gmtunersource.com. Racing personnel will respond to you with additional ordering information and part availability. Please allow up to twelve weeks for delivery.

All part numbers are subject to change. Please contact the appropriate source for the most recent information.

BASE ENGINE OVERVIEW

The engine is the heart of a competition car. It must be capable of delivering full power reliably run-after-run on race day, at engine and vehicle speeds far in excess of those encountered in normal driving. Every part of a competition engine must be as nearly perfect as possible – the slightest failure can put you out of the race.

Since 1955, the Small Block Chevy has proven its versatility, durability, and performance potential with automotive performance enthusiasts. The **ECOTEC** engine has all the basic mechanical components to repeat this success. A sound base engine structure, excellent airflow capability, easy serviceability, compact size and low weight. These qualities, along with the very successful race program, demonstrate the **ECOTEC** engine is a driving force in the sport compact segment. (Fig. 2)



Fig. 2

GM's **ECOTEC** engine has proven to be a reliable and competitive engine for use in Sport Compact Drag Racing. It has also proven its superior durability in grueling five mile runs at the Bonneville Salt Flats with speeds over 300 MPH and in showroom stock endurance road racing competition. The number of stock components utilized in the race engine demonstrates the robust design of the **ECOTEC** engine.

The **ECOTEC's** outstanding feature to performance enthusiasts is its impressive strength. GM Racing dynamometer tests confirm that major horsepower gains are possible with minimal modifications. For instance, when building an **ECOTEC** engine to the 400 hp power level, no modifications to the cylinder head, block, main girdle or crankshaft are required.

The production **ECOTEC** engine block is manufactured out of aluminum using a lost-foam casting process. This process allows for both a stronger and lighter part. Flanged, thin-wall iron cylinder sleeves are press-fit into a semi-floating aluminum support structure. The **ECOTEC** block is supported by a massive die-cast aluminum girdle/main cap assembly and structural oil pan for noise and vibration suppression. The main-cap structures are each supported with six fasteners. Extra-thick main bearings resist the differential thermal expansion of the nodular iron crank and aluminum block.

All **ECOTEC** blocks are cast with passages for piston-cooling jets and an oil cooler for high-output turbocharged applications. The fully-boxed block requires no windage tray, even on applications up to 600 horsepower. An auxiliary chain drives the water pump and balance shafts from the crank.

To reduce the risk of hot spots, pressure-cast, non-squish dished pistons are manufactured without valve reliefs. The symmetrical, barrel-faced moly-coated top ring fits in an

anodized ring-groove below a super-thin 3 mm top ring land, creating a low crevice volume for reduced emissions. The pistons deliver power through full-floating piston pins and powder-metal or forged steel connecting rods.

The **ECOTEC** twin-cam cylinder head uses low-friction hydraulic roller finger-followers, which have been proven reliable and effective up to 11,000 rpm. Head fastener placement permits cylinder head removal and installation without removing the camshafts. The camshafts are driven directly off the crank by a chain. The design includes provisions for variable cam phasing now found on select **ECOTEC** variants. The finger-follower design permits a light-weight narrow profile and reduced valve angles (the intake valve is 18 degrees from vertical and the exhaust valve 16 degrees).

The design of the intake manifold eliminates the need for variable-length intake runners and some **ECOTEC** engines now include direct injection.

The **ECOTEC** engine management system uses a port-EFI design with cassette waste-spark ignition.

The next several sections of this publication focus on performance modifications for the 2.2L **ECOTEC** engine installed in a 2005 Chevy Cobalt. The modifications shown could be performed on a number of GM vehicles.

See your local GM dealer for more information on ordering a vehicle equipped with the **ECOTEC** engine.

ECOTEC ENGINE CODES

Engine Code	Usage	Displacement	Bore x Stroke	CR:1	Fuel	Induction	Hp @ rpm	Tq @ rpm
L61	Saturn ION & VUE Chevy Malibu, Cobalt & HHR Pontiac G5	2.2L	86 x 94.6 mm	10	SFI	Naturally aspirated	148 @ 5600	152 @ 4200
LE5	Saturn ION & Sky Chevy Cobalt Sport & HHR Pontiac G5 GT, G6, & Solstice	2.4L	86 x 98 mm	10.4	SFI	Naturally aspirated with VVT	173 @ 6200	163 @ 4800
LSJ	Saturn ION Redline Chevy Cobalt SS S/C	2.0L	86 x 86 mm	9.5	SFI	Supercharged	205 @ 5600	200 @ 4400
LNF	Pontiac Solstice GXP Saturn Sky Redline Chevy HHR SS & Cobalt SS	2.0L	86 x 86 mm	9.2	DI	Turbocharged with VVT	260 @ 5300	260 @ 2500
LK9	Saab 9-3	2.0L	86 x 86 mm	9.5	MPFI	Turbocharged	210 @ 5300	221 @ 2500
LAT	Saturn Aura Green Line	2.4L	86 x 98 mm	10.4	SFI	Naturally aspirated hybrid	164 @ 6400	159 @ 5000

4T65E RACE MODIFIED TRANSMISSION



This section illustrates parts and modifications that are used to transform a 4T65-E automatic transmission for Off-Highway drag racing. Starting with the heavy duty or V8 application of the production transmission, the gearbox is modified into a three speed transmission with an aftermarket performance torque converter. The changes have proven to be reliable behind a 600 hp engine and track proven behind a 1000 hp **ECOTEC** engine.

The information contained in this section of the handbook has been provided by GM Powertrain in conjunction with GM Racing. The photographs shown are from a transmission that is configured for Sport Compact Drag Racing. This handbook attempts to illustrate the changes; however, it is not totally inclusive of all changes needed for a 1000 hp application.

Extensive modifications have been developed by GM Racing/Hydra-Matic to keep this transaxle constantly performing at high horsepower levels.



Fig. 126

The rear view above shows the oil pan modifications, transbrake location, plumbing, the output speed sensor location and wiring. (Fig. 126)

TRANSBRAKE

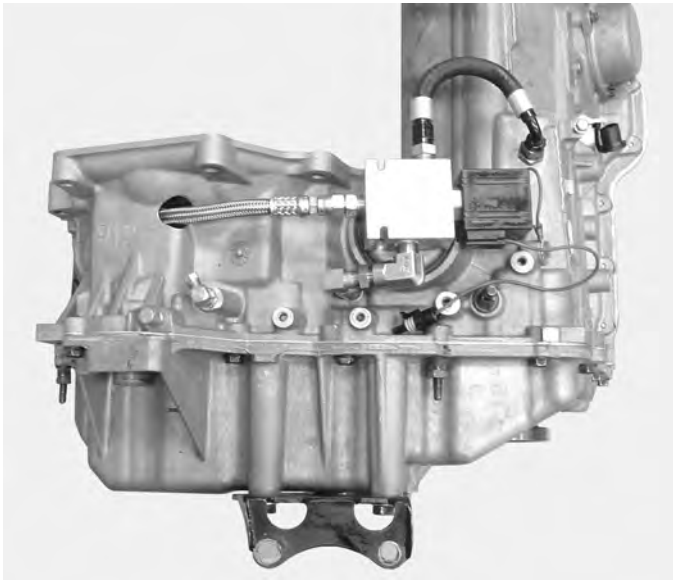


Fig. 127

The transmission brake is mounted externally on top of the transmission case and is operated with an on-off switch by the driver. A transmission brake may not be required on applications below 800 hp, although it is recommended where class rules allow it. (Fig. 127)



Fig. 129

The major sub-assemblies of the transbrake are shown above. The check ball assembly is not shown. (Fig. 129)



Fig. 128

The transbrake assembly is mounted externally above the reverse band servo cover and requires a 12 volt current to activate it. (Fig. 128)

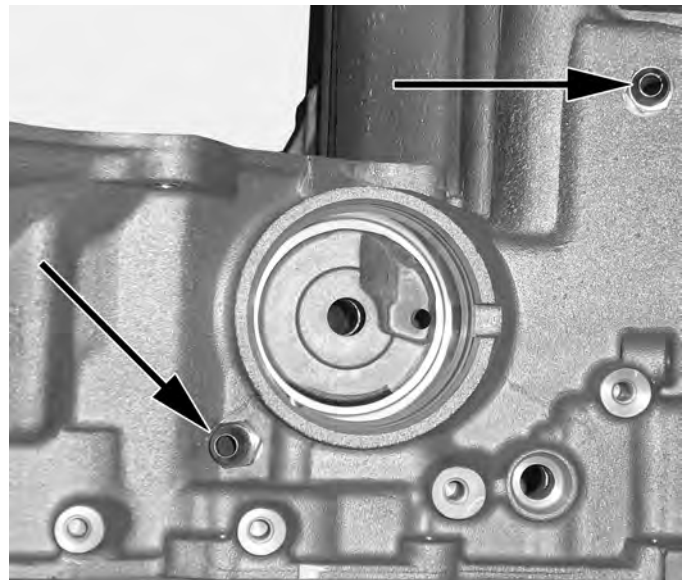


Fig. 130

The two fittings shown in the case are used for the transbrake system. The fitting in the lower left of the view is where low-1st gear oil is routed from the transbrake to apply the reverse band. When the transbrake is released, the oil is exhausted through the fitting shown in the upper right corner of the picture. (Fig. 130)



Fig. 131

A clearance hole through the case bell housing is provided for plumbing of the supply oil to the transbrake. (Fig. 131)



Fig. 133

This is the location of the transbrake pass-thru fitting on the case cover side of the case. Case ribbing is cut back to allow for clearance of the transbrake supply plumbing in this side of the case. Because of the modification to the case, the middle section of the upper case cover gasket is removed, making it a two-piece gasket. (Fig. 133)

TRANSMISSION CASE

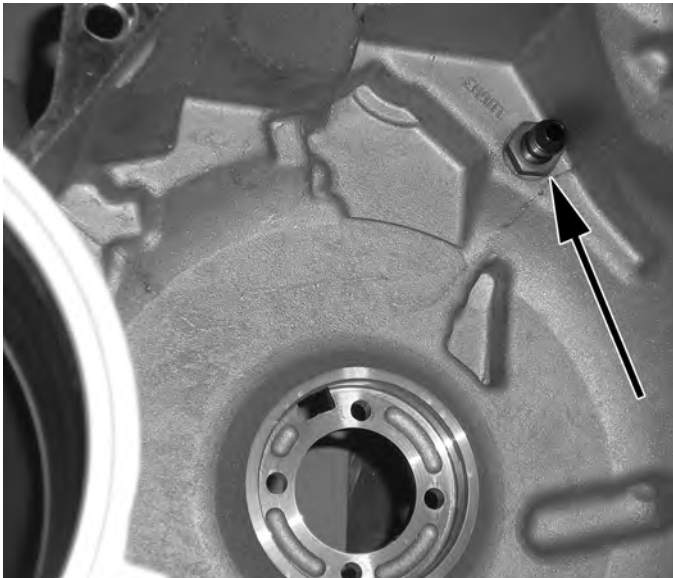


Fig. 132

This is the location of the transbrake pass-thru fitting on the torque converter side of the case. Oil is routed from this fitting through the hole in the top of the transmission bell. (Fig. 132)

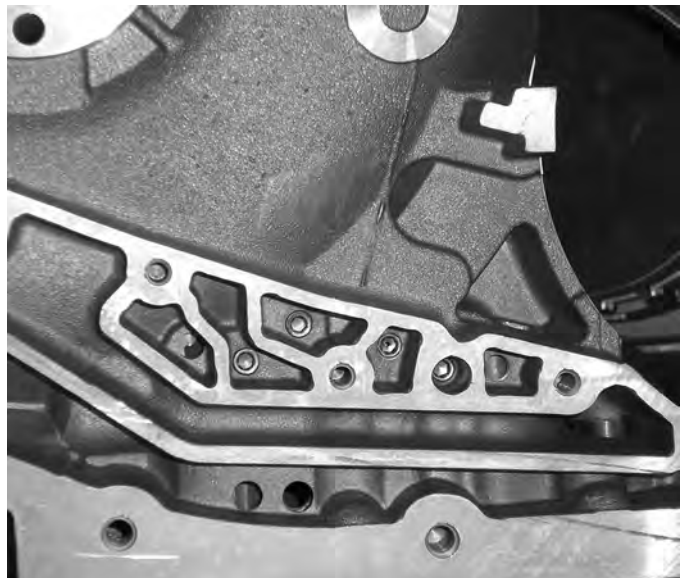


Fig. 134

Three passages are plugged in the lower part of the case because the 2-3 accumulator and the manual 2-1 servo are eliminated in the race unit. This allows two of these plugged passages to be drilled through for use as additional drain hole for the side cover cavity. The 1-2 accumulator is used in the race unit but the 2nd clutch feed oil to it, is reduced. (Fig. 134)

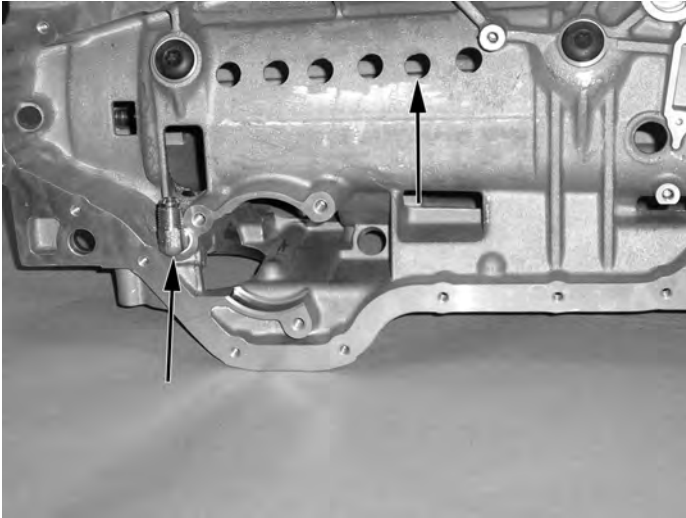


Fig. 135

Six additional oil drain holes have been added to the bottom barrel of the case. The thermal element is eliminated. A fitting is added for direct plumbing of forward servo oil from the lower accumulator housing. (Fig. 135)

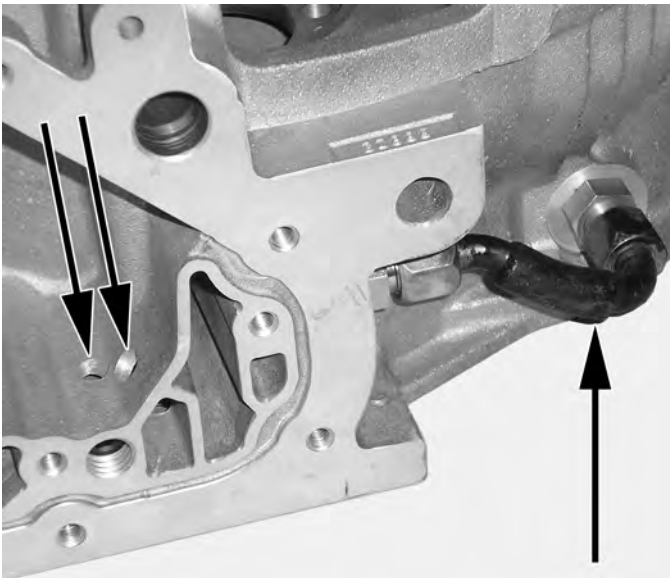


Fig. 136

The outlets of the additional side cover drain back holes in the case are shown above. The 3rd clutch oil passage is plugged to keep oil from accumulating in the 2-3 accumulator cavity. Also shown is the transmission oil cooler loop. A transmission oil cooler is not required in drag racing. (Fig. 136)

STATOR SUPPORT



Fig. 137

The O.D. of the drive sprocket support (stator support) is cut to clear the 1" wide x 7/16" pitch drive sprockets. (Fig. 137) The modified part is shown on the bottom of Fig. 137.

TORQUE CONVERTER



Fig. 138

The torque converter is manufactured by Coan Transmissions & Converters as specified for each application. (Fig. 138)

INPUT SHAFT



Fig. 139

The race input (or turbine) shaft is shown above on the right. The race shaft has increased wall thickness and the torque converter seal groove has been removed. In addition, the diameter of the shaft where the two torque converter seals are seated has been reduced. (Fig. 139)

OIL PUMP SHAFT



Fig. 140

The race pump shaft is on the top. This shaft is modified to fit inside the thicker walled turbine shaft. (Fig. 140)

DRIVE CHAINS

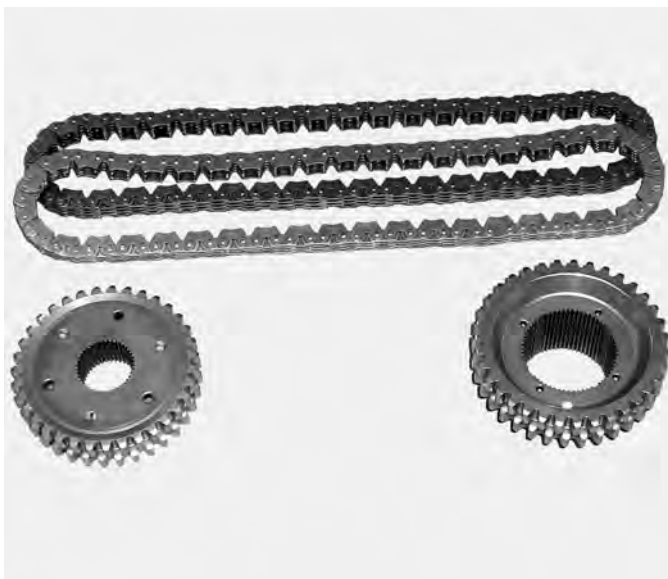


Fig. 141

Shown is the production dual Gemini chain and sprockets. (Fig. 141)



Fig. 142

The drive chain in the race unit is a 1" wide x 7/16" pitch chain with specially designed sprockets.

Note that the race-unit sprockets are not designed for use with the production speed sensor reluctor ring. Modification is required.

Thrust washers with PEEK material are also used in the race transmission. These washers are available as a GM service part, part numbers 24204840 and 24216480. (Fig. 142)

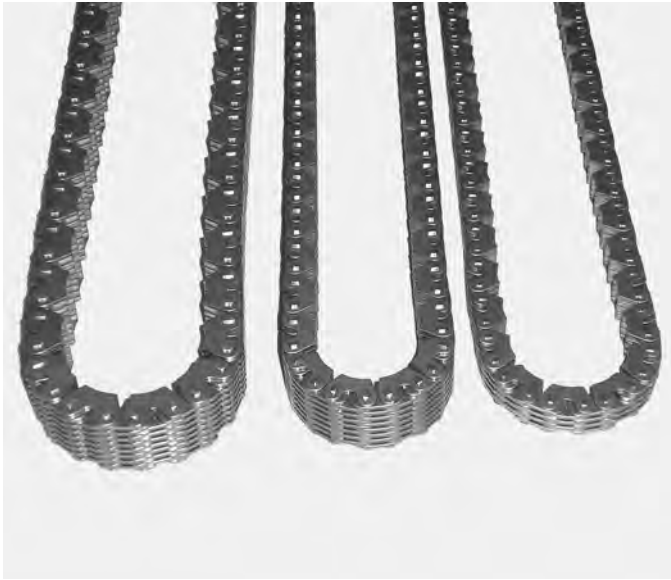


Fig. 143

The chain on the right (two required per transmission) is a production chain. The chain in the center, 1" wide x 3/8" pitch, was initially developed for the race unit, but was replaced by the 1" wide x 7/16" pitch chain on the left to handle the high horse power and torque. The 1" wide x 3/8" chain is excellent for applications up to 800 hp. (Fig. 143)

The drive link lube scoop must be modified to clear the chain. The amount of modification needed depends on the chain sprocket ratio. The production scoop comes in three different sizes.

SECOND GEAR CLUTCH



Fig. 144

A modified production 2nd clutch pack is used in the race unit. Another production plate is added to change the unit from a six to a seven plate clutch pack. (Fig. 144)

THIRD GEAR CLUTCH

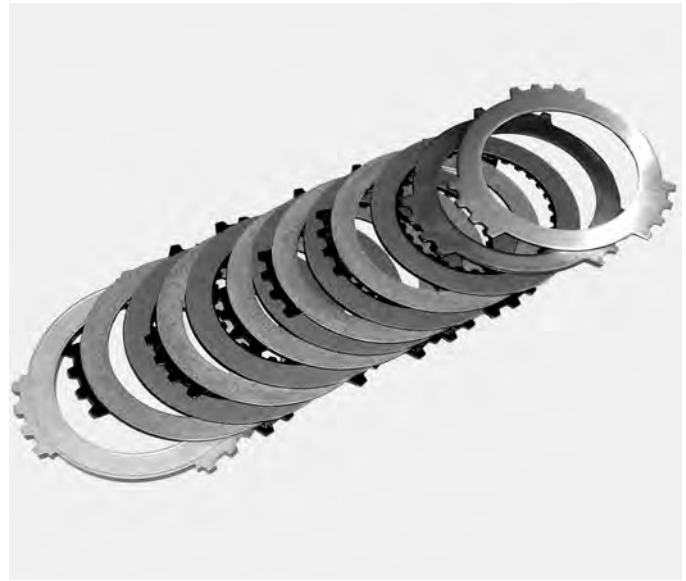


Fig. 145

The racing 3rd clutch pack is a specially designed Z-Pack 3rd clutch pack from Raybestos Powertrain. (Fig. 145)



Fig. 146

The race unit uses a specially designed backing plate from Raybestos Powertrain for the Z-Pack 3rd clutch. (Fig. 146)

FOURTH GEAR CLUTCH

The fourth clutch pack and piston assembly are removed from the race unit.

SINGLE WRAP BAND



Fig. 147

The production reverse band is modified to be a single wrap band for quicker release of the transbrake. The modified band is shown on the upper right of Fig. 147.

OIL DAM



Fig. 148

The production oil lube dam has been modified so that it can be assembled with the 4.0 final drive components. (Fig. 148) The modified part is shown on the left.

PLANETARY SET



Fig. 149

The input planetary carrier and reaction planetary carrier are stock V-8 LS4 application components. The gear sets are used without modifications. Specific to the V8 LS4 application are shot peened pinion gear teeth and roots, and lube scallops to direct oil to the pinions in the input carrier. (Fig. 149)

SPRAGS



Fig. 150

The current production pawl-type one-way clutches are used for 3rd and input without modifications. The one-way clutch on the left has the retainer removed to show internal components. (Fig. 150)

SUN GEAR AND SHAFT

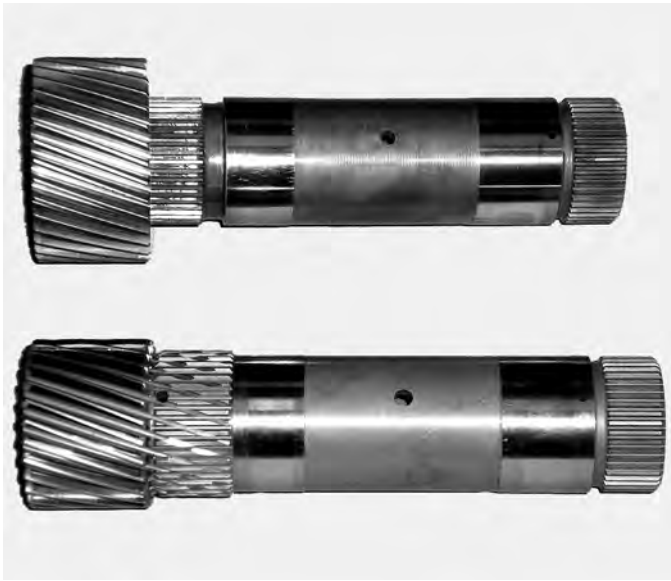


Fig. 151

The production sun gear and sun gear shaft (top) is replaced by a one-piece design (bottom) in order to package a final drive gear ratio change to 4.0. (Fig. 151) The one piece sun gear / sun gear shaft requires a revised park gear.

PARK PAWL GEAR



Fig. 152

The I.D. spline on the production park gear (left) is enlarged to fit onto the one piece sun gear / sun gear shaft. The modified part is shown on the right. (Fig. 152)

TORSEN® DIFFERENTIAL



Fig. 153

The production differential is replaced by a torque-biasing differential. The pinion carrier in the assembly is also replaced. The pinions in the carrier shown above are for a 4.0 final drive ratio. (Fig. 153)

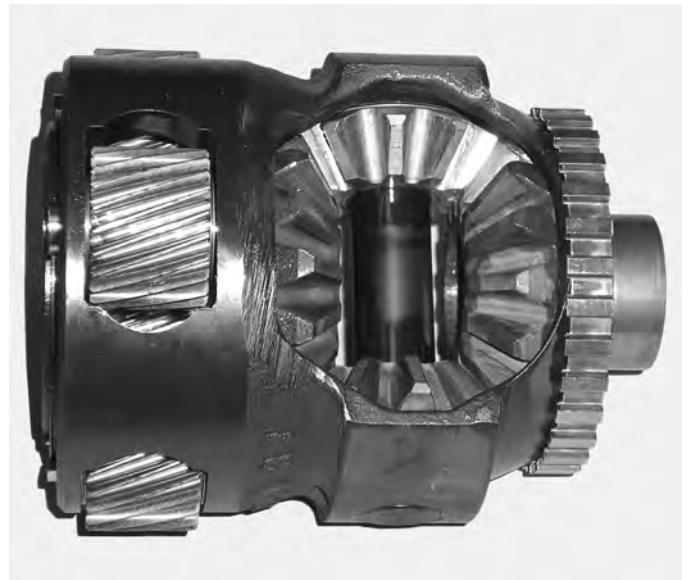


Fig. 154

Production differential and pinion carrier. (Fig. 154)

RACE OUTPUT FLANGES



Fig. 155

The race output flanges were designed to work with Porsche 930 CV joints. (Fig. 155)

MODIFIED FLUID PICK-UP



Fig. 157

The race unit fluid pick-up tube has been designed to work with a deep angled pan. The production filter is not used. A fine mesh screen is used on the inlet to filter the transmission fluid. (Fig. 157)

ACCUMULATOR AND FORWARD SERVO

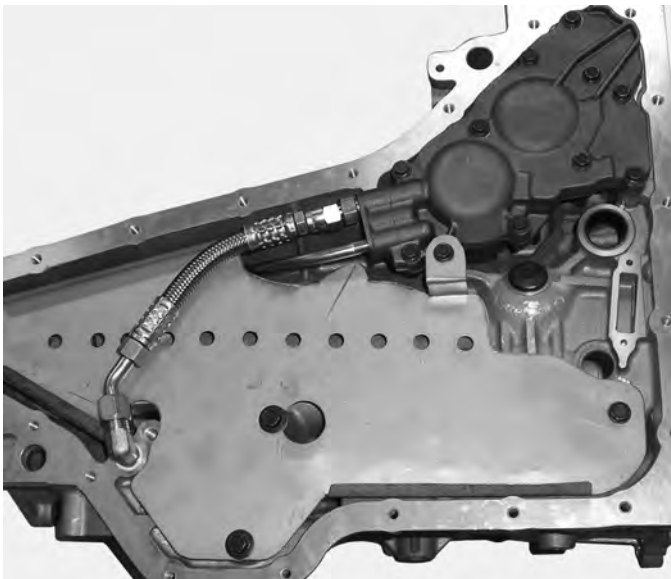


Fig. 156

Shown is the race unit with the lower accumulator assembly, oil baffle plate, and forward servo plumbing installed. Note that the thermal element and manual 2-1 servo assembly are removed. The lower accumulator assembly does not contain the 2-3 accumulator components. (Fig. 156)

RACE TRANSMISSION PAN 22°



Fig. 158

This deep oil pan has been designed to work with a 22° rotation of the powertrain in the vehicle. When installed in the vehicle, the bottom of the pan is horizontal. Additional pan magnets are used for the race unit pan. (Fig. 158)

MODIFIED TUBE AND INDICATOR



Fig. 159

A production Grand Prix, Bonneville, Monte Carlo, etc. transmission fill tube is shortened at the fill end and lengthened at the pan end to accommodate the deeper pan. The locking dip stick is a shortened production 4L65-E GM light-duty pickup truck's fluid dip stick. (Fig. 159)

SEPARATOR PLATE

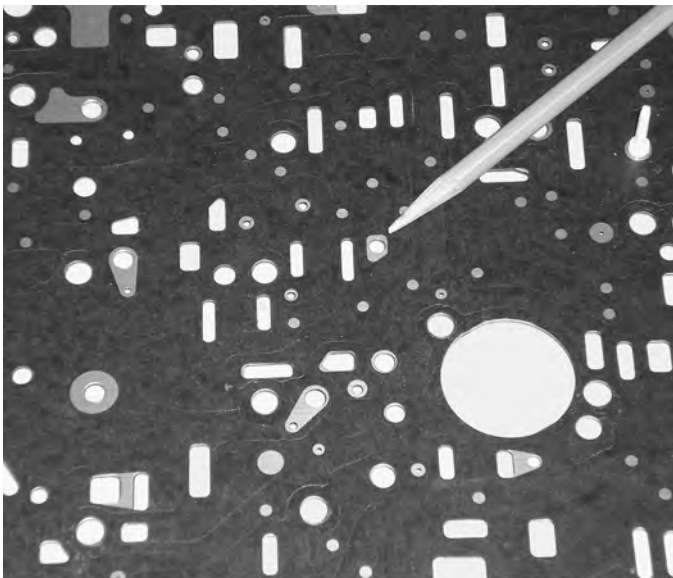


Fig. 160

The only modification to the valve body separator (spacer) plate is to enlarge the #2Y or #33 (input clutch feed) hole to a diameter of 0.160". (Fig. 160)

VALVE BODY

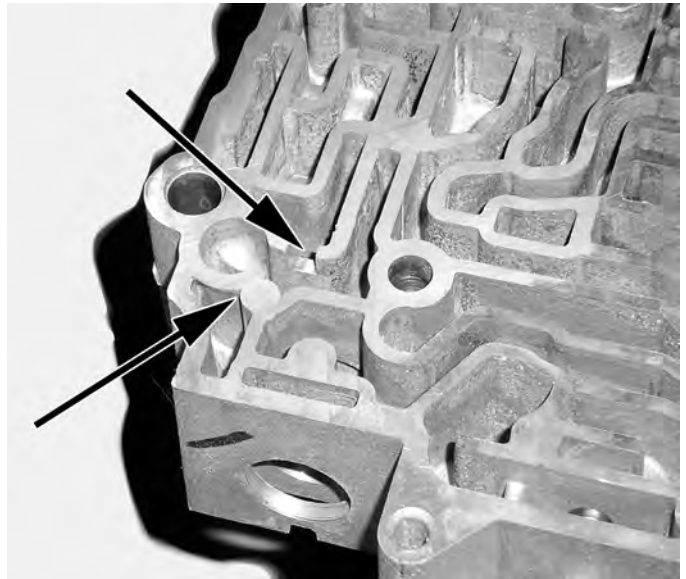


Fig. 161

Shown above is one of the two modifications to the race unit valve body. The fluid through the #5 reverse servo check ball is re-routed to act as a check valve so that when the transbrake is applied, the reverse oil does not leak through the manual valve. (Fig. 161)

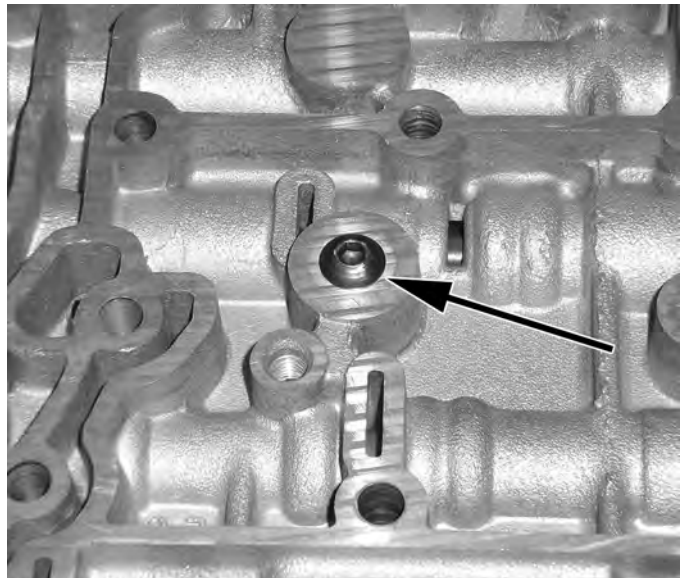


Fig. 162

The other modification to the race unit valve body is the plugging of the torque converter clutch oil port to the pressure switch manifold (PSM). The PSM is eliminated from the race unit. (Fig. 162)

PRESSURE REGULATOR

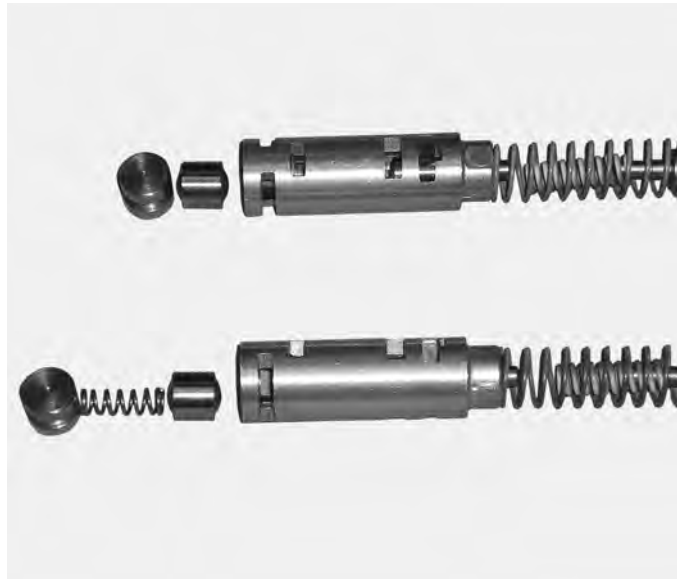


Fig. 163

A spring has been added between the line boost valve and the valve bore plug. It has to maintain a 300 psi line pressure. (Fig. 163)

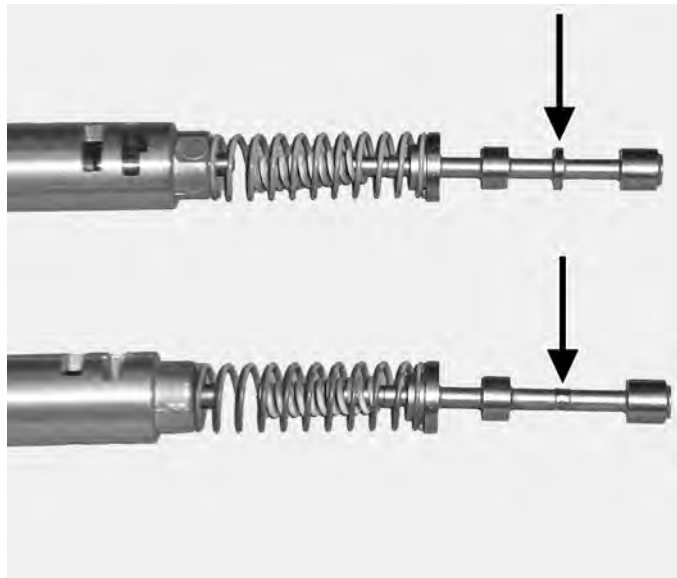


Fig. 164

The second modifications to the pressure regulator assembly is the removal of the middle spool of the pressure regulator valve. By removing the spool, oil flow to the converter is never interrupted. (Fig. 164)

CASE COVER

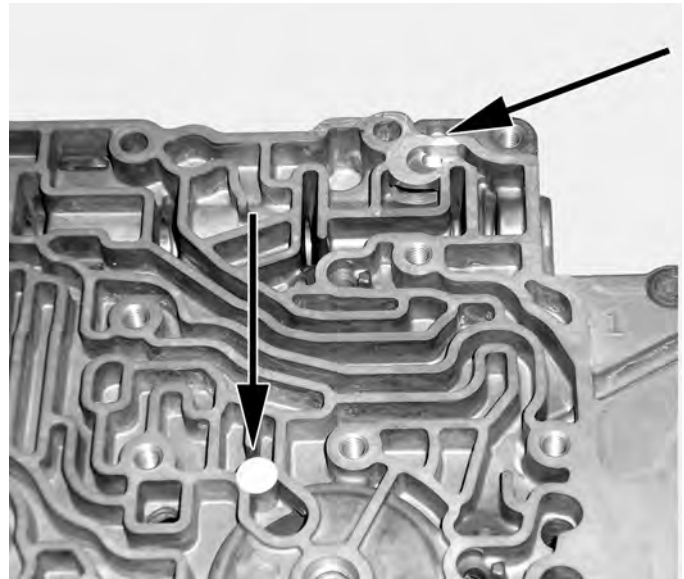


Fig. 165

Shown above are two modifications to the race unit case cover (channel plate). Shown in the upper right corner is the rerouting for the #5 reverse servo check ball. Also shown is the plug in the 4th clutch oil passage to 3-4 accumulator. (Fig. 165)

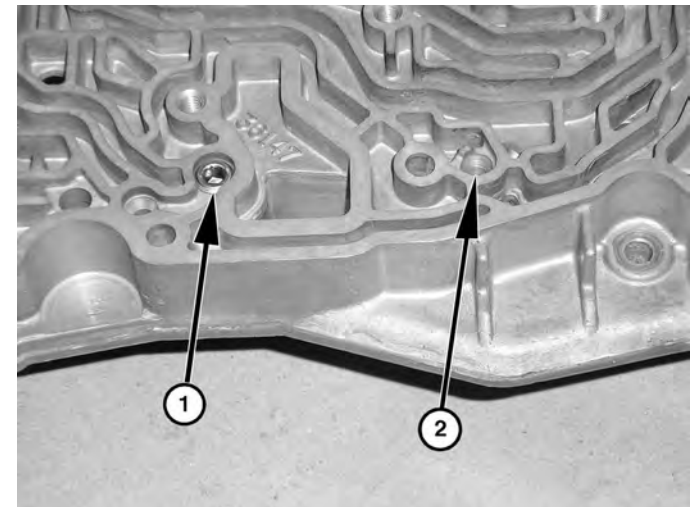


Fig. 166

1. The torque converter blow-off valve is removed and is plugged in the case cover.
 2. Check ball #2 (2nd clutch) is removed.
- Check ball #9 (3rd clutch) is also removed. The cooler check ball (in case cover) is removed to eliminate a flow restriction. All other check balls are used in their production location. (Fig. 166)



Fig. 167

Shown above is the case side of the case cover with the plumbing used to supply the trans brake with low-1st gear oil. A 1" drive sprocket and the wire leads from the input speed sensor are also shown. The production input speed sensor and reluctor ring are removed and the sensor bore is plugged. (Fig. 167)

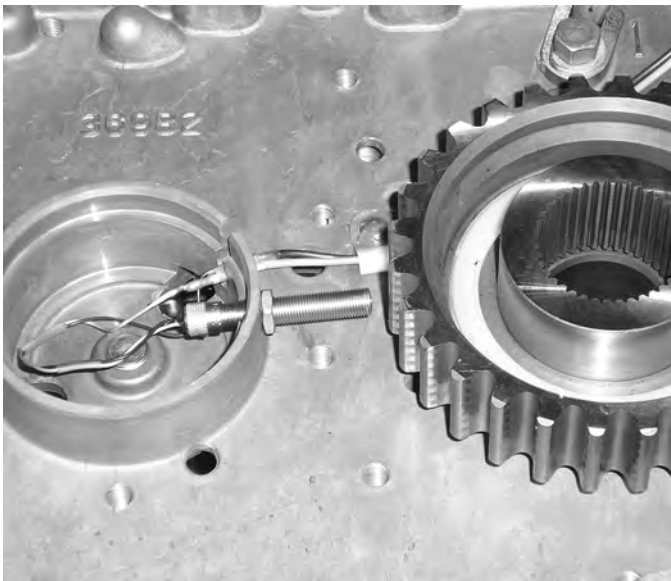


Fig. 168

The production input speed sensor reluctor wheel is not used in the race unit. Instead, the teeth of the drive sprocket are used with a Honeywell magnetic pickup. The Honeywell magnetic pickup (input speed sensor) is mounted in the 3-4 accumulator bore with the 1" drive sprocket positioned on the case cover. The 3-4 accumulator piston pin bore is plugged because the 3-4 accumulator components are not used in the race unit. (Fig. 168)

4T65E SHIFT LOGIC

The 4T65E transmission is shifted with two shift solenoids. The ground sides of the solenoids are pin A and pin B in the pass through connector. Pin E requires switched 12V. The shift algorithm of the 4T65E is:

SHIFT ALGORITHM OF THE 4T65E		
	Solenoid A	Solenoid B
1st gear	on	on
2nd gear	off	on
3rd gear	off	off
4th gear	on	off

SHIFT CONTROLLERS



Fig. 169

TCI and CompuShift offer automatic shift controllers that will operate the 4T65E Transmission.

An inexpensive alternative for drag racing use is the MSD Programmable shift controller part number 7559. (Fig. 169) This controller was developed to shift a Lenco type transmission. With a little ingenuity it can easily be adapted for use on the 4T65E transmission.

Two relays are needed to convert the system for this application. The MSD controller needs two inputs: Launch/Reset and Shift Override. The Launch/Reset button resets the controller to first gear both in electrical outputs and in the shift sequence. The Shift Override button manually up-shifts the controller. In first gear the controller does not output a signal. When the 1-2 shift is made it turns on a 12v signal. When the 2-3 shift is made another 12V signal is turned on. Since the solenoid needs a ground to activate, relays are needed. Ground should be

connected to the input of the two relays. The normally closed output of the 1st relay should be connected to pin A on the transmission pass through connector. The normally closed output of the 2nd relay should be connected to pin B of the transmission pass through connector. One side of the coil of each relay should be connected to ground. The 1st shift output from the transmission controller should be connected to the other side of the coil of the 1st relay. The 2nd shift output from the transmission controller should be connected to the other side of the coil on the 2nd relay. The normally open side of the relay can be used for gear indicator lights. Two lights can be connected to power and the other side of the lights connected to the normally open side of the first and second relays.

When the transmission is in 1st both lights will be off, in second the 1st light will turn on and in 3rd the second light will come on.

TRANSMISSION FLUID INFORMATION

Fluid Type: GM Dexron® VI.

Fluid Quantity: Fluid fill quantity will depend on the transmission oil pan configuration and whether the torque converter is dry. Past experience has shown that about twelve quarts are added to the 4T65 transmission with a dry torque converter and 22° modified pan. Always check the fluid level at operating temperature and while the engine is idling. Do not overfill - keep the level below the spinning components of the transmission to reduce foaming of the fluid. Track experience has found that checking the oil level at engine idle and in first gear with brakes applied produces a consistent readable oil level indication on the dip stick.

4T65E PERFORMANCE TRANSMISSION PARTS LIST

PARTS LIST		
DESCRIPTION	PART NUMBER	SOURCE
4T65–E Assembly for Race Applications only	CPT700	GM Racing
1"x7/16" Sprocket/Chain Set, (Ratio 1) 28 tooth drive, 32 tooth driven, 7/16" Chain, Drive Sprocket support Assy.	CPT701	GM Racing
1"x7/16" Sprocket/Chain Set, (Ratio 2) 29 tooth drive, 31 tooth driven, 7/16" Chain, Drive Sprocket Support Assy.	CPT702	GM Racing
1"x3/8" Sprocket/Chain Set, (Ratio 1) 33 tooth drive, 37 tooth driven, 3/8" Chain, Drive Support Assy.	CPT703	GM Racing
1"x3/8" Sprocket/Chain Set, (Ratio 2) 35 tooth drive, 35 tooth driven, 3/8" Chain.	CPT704	GM Racing
LINK ASM–DRV (7/16" Pitch Chain)	CPT705	GM Racing
LINK ASM–DRV (3/8" Pitch Chain)	CPT706	GM Racing
SHAFT ASM–TURBINE (Input Shaft Assembly) Turbine Shaft and Sleeve and pump shaft	CPT708	GM Racing
3rd Gear Clutch Pack	CPT709	GM Racing
Differential and Final Drive Assembly 3.29 incl. Torsen, pinion gears, pins	88958682	GM Performance Parts
Differential and Final Drive Assembly 3.29 without gears & pins	CPT711	GM Racing
Differential and Final Drive Assembly 4.0 incl Sun and Park Gears Sungear and Sungear shaft GEAR–PARK	CPT712	GM Racing
930 CV Output Flange RH	CPT713	GM Racing
930 CV Output Flange LH	CPT714	GM Racing
Adapter Plate – ECOTEC to 4T65	CPT715	GM Racing
4T65–E CASE Assembly w/ increased bell–housing wall thickness	CPT717	GM Racing
Torque Converter		Coan
Planetary Assembly	24208311 & 24225849	GM Service Part

* GM Racing parts are available only by emailing us through our website at www.gmtunersource.com.