The 1978-79 Muncie Four-Speed: What Makes Your M20 Work?

After thirty-five years, owners of a 1978 base L48 M20 power team are surprised when transmission repair, maintenance or restoration requires attention and owner discovers a cast iron box. The number of 1978 Corvettes shipped with four-speeds and the model year's many fabled power team configurations continues debate but those numbers show that only 70 Corvettes were shipped with the Muncie four-speed. Over the years, owners that acquired a Muncie equipped 1978 have searched discussion forums seeking answers in regards to shift linkage, bellhousing, clutch, flywheel size or just curious if the cast iron box is the original four-speed shipped installed from the St. Louis assembly plant.

This article describes that learned about the 1978 Muncie since *The Corvette Restorer* first reported the four-speeds of 1978 in the winter 2009 issue. It also updates missing data published in that issue. These lessons have come from Assembly Instruction Manuals reviews and a comparative study of parts by both owners and NCRS Technical Board members who share a curiosity for oddball configurations, installed and shipped from the St. Louis Assembly plant.

Background

The heritage of the 1978 Muncie four-speed stems from the Saginaw economy four-speed used during the 1960s and early 1970s. Re-introduced in 1978, the Muncie-Saginaw rallied GM measures to reduce cost and met EPA fuel economy standards. It also saw service on 1979 Corvettes through mid-year. The cast iron construction sports a 7-bolt cast iron cover and contrasts to the Muncie built in the 1960s assembled with aluminum cases. Tooling transferred from the Saginaw plant to the Muncie plant in the early 1970s and once re-introduced, while

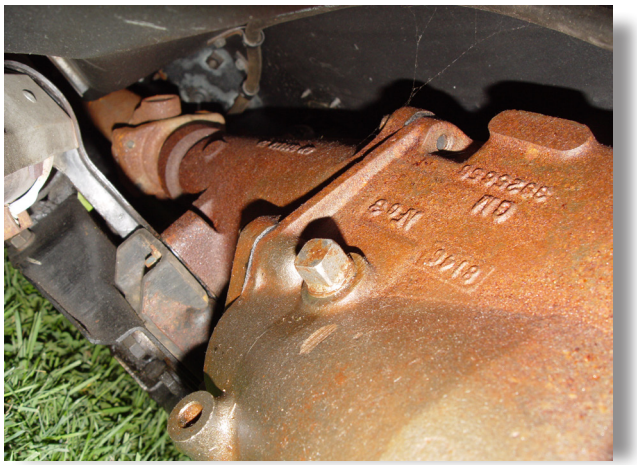

Figure 1: Muncie cast iron maincase and extension housing

called a Muncie, was short-lived. Used throughout Chevrolet production lines for lower performance applications, by 1980 had become a vestige of the 1970s.

This Muncie is a 2.85:1 wide ratio manual transmission used for L48 (350/175, 185, 195HP) applications. The intent of the higher-ratio was to offer the low-powered Corvette punch. Figure 1 shows a Muncie installed in a 2136 mile 1978 L48 M20 Silver Anniversary corvette. Note rusted stamp pad at the top rear of the main case (passenger side). Figure 2 illustrates a Muncie removed for maintenance and its broadcast code (S6), main case casting number, and stamp pad.

Figure 2: Maincase, broadcast code, VIN pad

Muncie stamped identification and assembly date codes on two separate stamp pads in contrast to a B/W vehicle identification number (VIN) derivative and date code on the same pad surface. The VIN derivative was located on the main case boss (Figure 3) at the top. The assembly date code stamped on a boss is located on the left side (driver's side) of the maincase, to the rear of the sidecover and below it (see Figure 4 & 5). The format is R 8 H 01 where:

- R = Muncie plant
- 8 = Model year
- H = Month – June
- 01 = Day of the week

Assembled at the Muncie plant June 1, 1978, Figure 5 shows the Muncie assembly date code pad. Note the date code is double-stamped and assembled at the Muncie plant June 1, 1978. The Corvette that hosts this four-speed was built the third week of June. Interesting enough, the dealer order form had "M20" written on the order and specified the L48 engine. When order confirmation came back to the dealer from the GM zone office, the RPO printed was MM4.

Figure 3: VIN Derivative 1S8902535

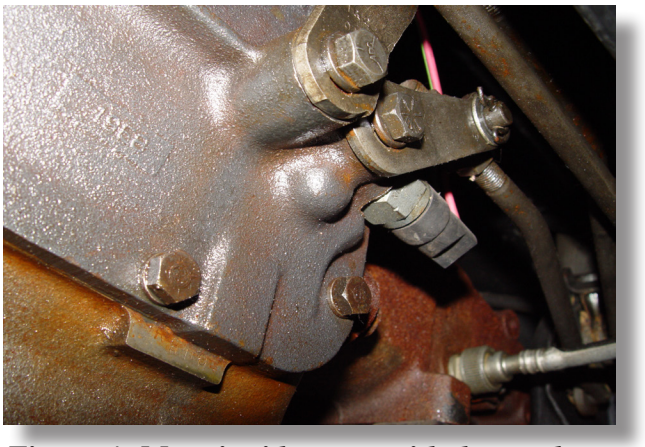

Figure 4: Muncie side cover with date code at bottom of cover

Table 1
Four-Speed Transmission Summary

Engine RPO	Dealer RPO	Manifest RPO	Ratio	Broadcast Code
L48	MM4	M20	2.85:1	S6
L82	MM4	M20	2.64:1	ZU
L82	M21	M21	2.43:1	ZW

Table 2
1978-79 Four-Speed Shift Linkage

Four-Speed	1st & 2nd		3rd & 4th		Reverse	
	Rod	Lever	Rod	Lever	Rod	Lever
B/W M21	378178	378203	378177	378204	339745	378205
B/W M20						
Muncie M20		378182		378181	378179	378183

The computer calculated that when the base motor L48 was specified with 4-speed, to call out and print the M20 broadcast code S6 on the buildsheet. Table 1 summarizes data for the four-speeds of 1978 by engine, RPO, broadcast and first gear ratio.

Figure 5: Muncie assembly date code: Assembled at the Muncie plant June 1, 1978

Shift Linkage

The shift linkage for the rods and levers was a mix of existing part numbers and some unique, one of a kind, new numbers. Most linkage parts carried the same part number as those parts used for the 1978 Borg Warner (B/W) four-speeds. The difference came for the reverse linkage due to the fact that the reverse lever shaft protruded from the side cover.[1] In contrast, Borg Warner applications had the reverse lever shaft exit from the rear case. Table 2 shows the four-speeds used in 1978-79 versus the part numbers for the rod and lever for 1st & 2nd, 3rd & 4th and reverse. Figure 6 and 7 contrasts the B/W 9-bolt cover to the Muncie 7-bolt cover and shows the reverse shaft exiting the cover.

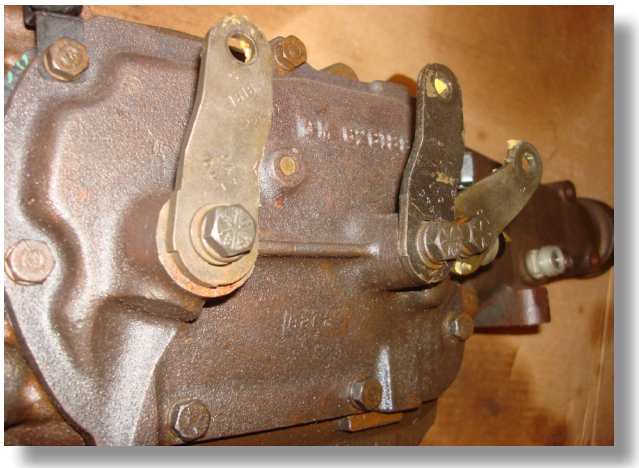

Figure 6: Muncie 7-bolt side cover

1 The reverse shifter rod, GM #378179, for the 1978-E79 "Muncie" transmission was unique to the Corvette application.

Clutch Housing

Commonly referred to as the bellhousing, the clutch housing hosts the clutch, pressure plate and flywheel and in 1978-79 L48 engines shipped with an oddball flywheel/clutch configuration. The bellhousing typically carried the casting number GM 3899621. One detailed reference guide[2] lists the GM 3899621 bellhousing designed for the 11" clutch/168-tooth flywheel. The 168 tooth flywheel is 14 inches in diameter. L48 M20 owners have discovered that mated with their 168-tooth flywheel is a 10.5 clutch. Typically, a 10.5" clutch mates with the 153 tooth flywheel (12 ¾ inch).[3]

The bellhousing also becomes an interesting mix of numbers for the Muncie owner. Installed with bellhousing casting GM# 464697 on L48s, some carried the part number GM# 3899621. The boss on the casting was drilled to accommodate two types of clutch ball forks. When drilled and tapped on the lower portion of the boss, it remained 464697 but when drilled and tapped on the upper portion of the boss the bellhousing became 3899621…but still showed casting 464697 (Figure 8). Sold over-the-counter (NOS), the bellhousing carried the GM #3899621 casting number.

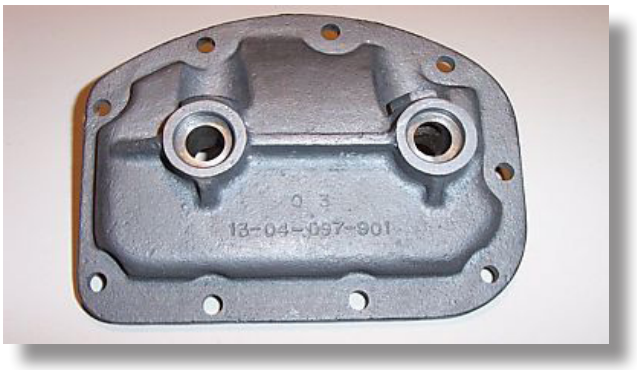

Figure 7: Borg Warner 9-bolt side cover

Figure 8: Bellhousing casting GM# 464697

2 Colvin, A.L., Corvette by the Numbers: The Essential Corvette Parts Reference 1955-82, Bentley Publishers, 2002.

3 The GM# 464697 bellhousing saw dual-use during this period. The boss drilled/tapped in the upper portion for automotive clutch ball fork application. The casting number was 464697 but once drilled/tapped carried GM #3899621. Truck applications used the #464697 with the boss drilled/tapped in the lower part.

Table 3
Comparison of Flywheels & Related Hardware

Flywheel		Clutch	Bellhousing	Starter Bolt Mount Pattern
Tooth	Inch Size			
168	14"	10.5"	464697 3899621	Offset Mount
		11.0"		
153	12 ¾"	10.5"		Straight-Across Mount

Table 4
Transmission Case Part Numbers

Cast Description	Muncie	B/W M20	B/W M21
Maincase	3925656	1304 065 903	1304 065 903
Extension Housing	352264	13.04.066.901	13.04.066.901
Sidecover	6261886	13-04-097-901	13-04-097-901

It was customary in the 1970s for GM to consolidate part use and therefore this combination would permit all three four-speeds in 1978 to use one flywheel (168-tooth) and match it up with the same starter style. The only variable part would be the clutch. The B/W M20 and M21 called for the 11" clutch while Muncie used the 10.5 clutch. The flywheel was drilled and tapped to accommodate either clutch size by the engine plant and shipped to the assembly plant ready to bolt up to a four-speed. Table 3 compares the 168-tooth flywheel versus the 153-tooth flywheel and related hardware.[4]

Related Oddball Hardware

Additional oddball hardware accompanied the Muncie and owners discovered these differences along the way. For example, the input shaft was 10-spline (GM # 3859030) in contrast to the typical 26-spline input shaft customarily used with four-speeds installed throughout the 1970s in both Corvette and other GM brands. In contrast, the 10-spline input shaft was typical of the application that accompanied four-speeds used in the 1960s. Spline count becomes important for Muncie owners when replacing the clutch. An owner would not want to get a clutch with a typical 1970s 26-spline configured clutch when his Muncie is a 10-spline unit.

Transmission case parts are not interchangeable either. Table 4 shows part numbers for the maincase, extension and cover for the M20 B/W, M21 B/W or the Muncie. The B/W cover is a 9-bolt cover while the Muncie is a 7-bolt cover.

Summary

Believe it or not, thirty-five year old Corvettes will need maintenance, repair or part replacement whether driven hard or serving as a trailer queen. Many 1978 models, particularly Pace Cars saw more garage time than track time. As these Corvettes passed to family members or other owners, they discovered something rare, and probably irreplaceable, about the L48 M20 equipped power team. We hope this review of the L48 Muncie configuration helps owners learn the uniqueness of the power team but also prepares them for the market place as they pursue service and part replacement options.

The author and The Corvette Restorer appreciate the C3 owners who have contributed to this article in the spirit that L48 M20 owners would benefit. In particular, special thanks to Paul Collamati, Joe Lucia, Paul Ruggeri, Matt Novak and Matt Surette.

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4 Once a 14" flywheel was drilled/tapped for a 10.5" or 11.0" clutch application, either bellhousing casting could have been and was used.