



ZF 8 Speed Automatic Transmission

Equipment And Tool Institute Tech Day

June 13 2012





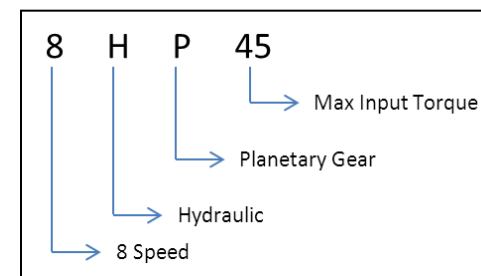
Agenda

- ☐ **General Information**
- ☐ **Chrysler Application Plan & Launch Timing**
- ☐ **Capability**
- ☐ **Technical Data**
 - Manual Park Release (MPR)
 - Stop Start Technology
 - External Features
- ☐ **Service Concerns**
- ☐ **Wrap Up and QnA**



8HP General Information

- RWD Transmission which will replace majority of RWD based ATX trans
 - WA580, 545RFE, etc
 - Will not replace HD transmissions (ie 68RFE, etc)
- Available in 3 different models:
 - 8HP45*
 - 8HP70
 - 8HP90
- Launched 2012MY at Brampton Assembly Plant
- Launch in Ram 1500 Trucks August 2013
- Both RWD and AWD options (no FWD)
- “Modular Design” allows for future expansion (ie. hybrid)



*8HP45 will eventually be replaced by 845RE from ITP



8HP General Information – Key Benefits

- ❑ **Improved Fuel Efficiency – up to 15%**
 - 2011 Chrysler 300 w/ 5 speed: 18 / 27mpg
 - 2012 Chrysler 300 w/ 8 speed: **19 / 31mpg**
- ❑ **Fully electronic interface with vehicle**
 - No need for shifter cable, “shift by wire”
 - Allows for greater flexibility of shifter design/location
- ❑ **Compact design**
 - 5 pounds lighter than predecessor (WA580)
 - Very similar packaging dimensions
- ❑ **State of the art technology**
 - Every component optimized for durability, weight, cost, serviceability
 - Extremely fast shifts
 - Ability to downshift from 8th to 2nd gear for optimal acceleration
 - Achieves 8th gear at 43mph for optimum fuel economy
 - Torque Converter able to lock up in all 8 gears



Application Plan & Launch Timing



2012 Chrysler 300

2012 Dodge Charger

- ☐ 2012 MY (July 2011)
- ☐ Brampton Assembly Plant (Toronto, Ontario)
- ☐ V6 Pentastar
- ☐ RWD and AWD
- ☐ eShift equipped
- ☐ 80,000+ shipped to date
- ☐ To be replaced by 845RE / TorqueFlite8 trans Dec 2012



2013 Ram 1500

- ☐ 2013 MY (September 2012)
- ☐ Warren Truck Assembly & Saltillo Truck Assembly
- ☐ V6 Pentastar
- ☐ RWD and 4WD
- ☐ eSHIFT Rotary knob
- ☐ Stop/Start Technology
- ☐ To be replaced by 845RE / TorqueFlite8 trans July 2013



Technical Data

☐ 8 speed fully automatic RWD (N-S Orientation) Transmission

☐ 5 clutch packs

☐ 4 planetary gear sets

☐ Mechatronically controlled

- Bosch TCU & Valve Body Integrated
- Eliminates external trans controller

☐ Fill For Life Transmission

- No Fill tube or dipstick
- Fluid check via plug on side of trans
- Proprietary trans oil (Shell L12108/Lifeguard8) - ~ 9L oil

☐ External Trans Oil Cooler – all applications, no HD unit required

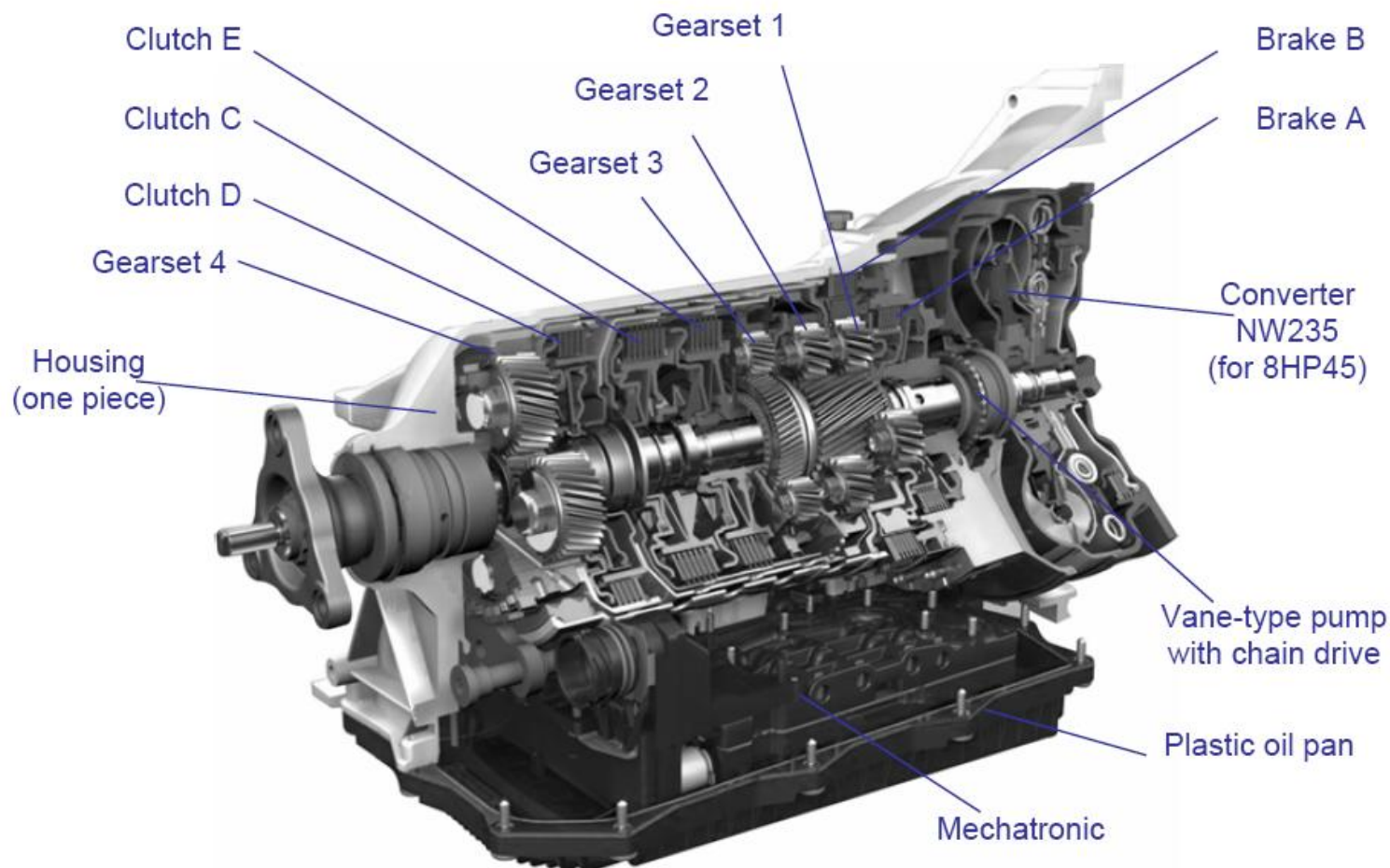
- 1/2" lines, Jiffy Tite connectors, 15L/min (max) flow

☐ Torque Convertor

- 235TTD (Torsional Turbine Damper)
- Fully lockable, 40rpm max slip

Gear	Ratio	Ratio Step	Clutch A	Clutch B	Clutch C	Clutch D	Clutch E
1 st	4.71		x	x	x		
2 nd	3.14	1.50	x	x			x
3 rd	2.10	1.49		x	x		x
4 th	1.67	1.26		x		x	x
5 th	1.29	1.30		x	X	x	
6 th	1.00	1.29			X	x	x
7 th	0.84	1.19	x		X	x	
8 th	0.67	1.26	x			x	x
Rev	3.30		x	x		x	
Spread	7.03						
Park			x	x			
Neutral							
Default	6 th Gear				X	x	x

Technical Data: Cut Away





Technical Data: Transmission Capability

	8HP45 Gas	8HP70 Gas*	8HP70 Diesel*	8HP90*
Engine Torque Capacity	450Nm/ 332 ft-lbs	700Nm/ 516 ft-lbs	700Nm/ 516 ft-lbs	900Nm/ 664 ft-lbs
Input Torque Capacity	550Nm/ 406 ft-lbs	760Nm/ 561 ft-lbs	760Nm/ 561 ft-lbs	1100Nm/ 811 ft-lbs
Power	250kW/ 335hp	380kW/ 510hp	230kW/ 308hp	550kW/ 738hp
GCW	5669kg/ 12500 lbs	7256kg/ 16000lbs	7256kg/ 16000lbs	7256kg/
Max Speed	7200rpm	7200rpm	5500rpm	7000rpm
Min Idle Speed	550rpm	550rpm	550rpm	550rpm
Max Speed in 8 th Gear	5700rpm	5700rpm	5500rpm	5600rpm
Trans Length x barrel diameter	672mm x 178mm	682mm x 200mm	682mm x 200mm	700mm x 200mm
2WD Trans weight as shipped with oil	80kg/ 176lbs	92kg/ 203 lbs	94kg/ 207 lbs	97kg/ 214 lbs

* - Tentative



Technical Data: Cross Section

4 Gearset Design

- 8 speeds
- Wide ratio spread
- Small steps

5 Clutch Pack Design (A-E)

- Only 2 open clutches in any gear

Low Viscosity Oil

- Reduced spin loss
- Improves cold FE
- Fill For Life

Output Flange
(RWD Shown)

Stand 06-03-10

Off Center Line Pump

- Optimal Pump Sizing

Mechatronic Unit

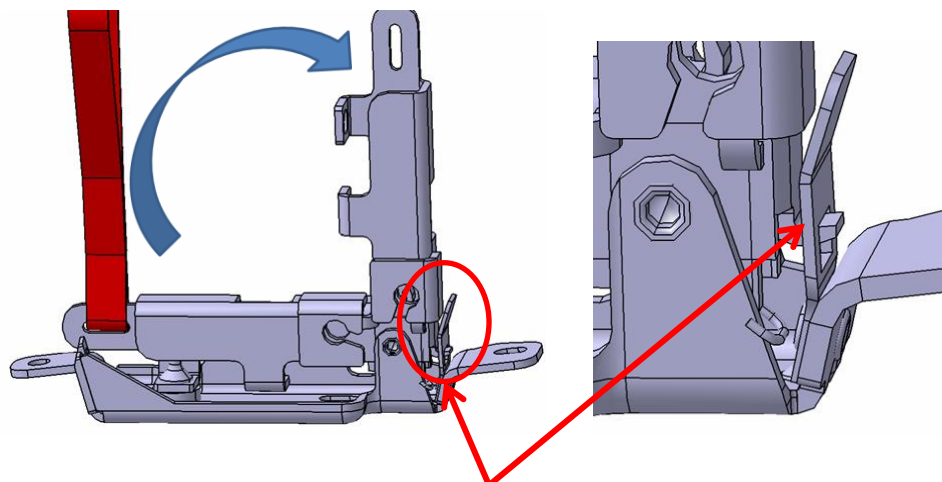
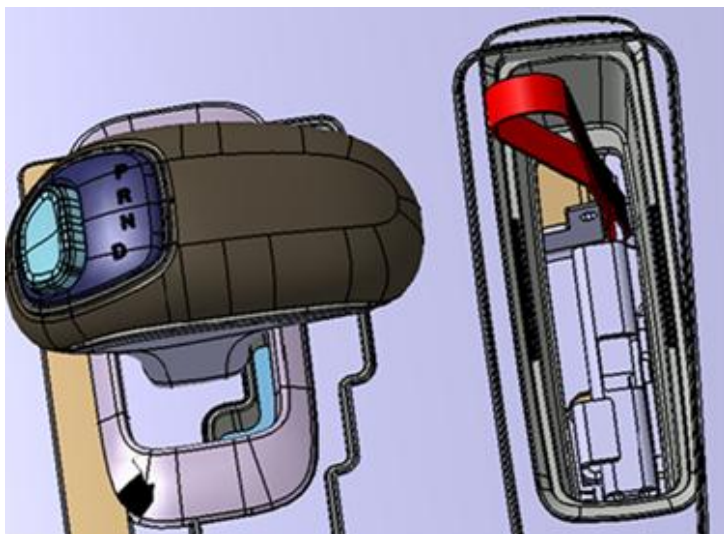
Stop/Start Unit

Location



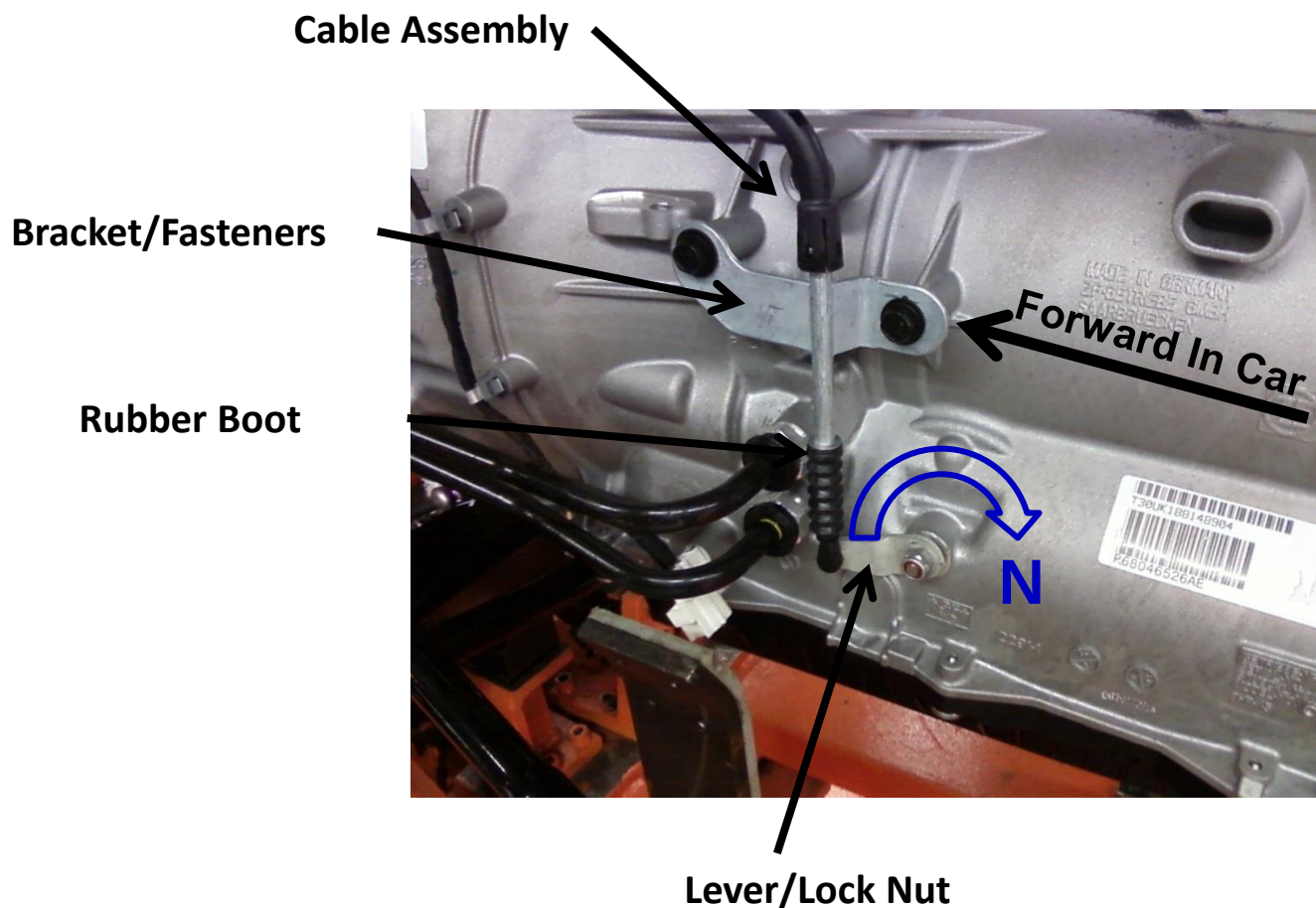
Technical Data: MPR (Manual Park Release)

- ❑ Allows owner to manually put transmission into neutral
- ❑ System designed for emergency usage only
- ❑ Lever (in cabin) and cable (to trans) assembly
- ❑ Manually actuates park rod, disengages from park gear
- ❑ Allows for towing of disabled vehicle



Latch will keep lever open (in Neutral). Transmission is now pulled out of Park.

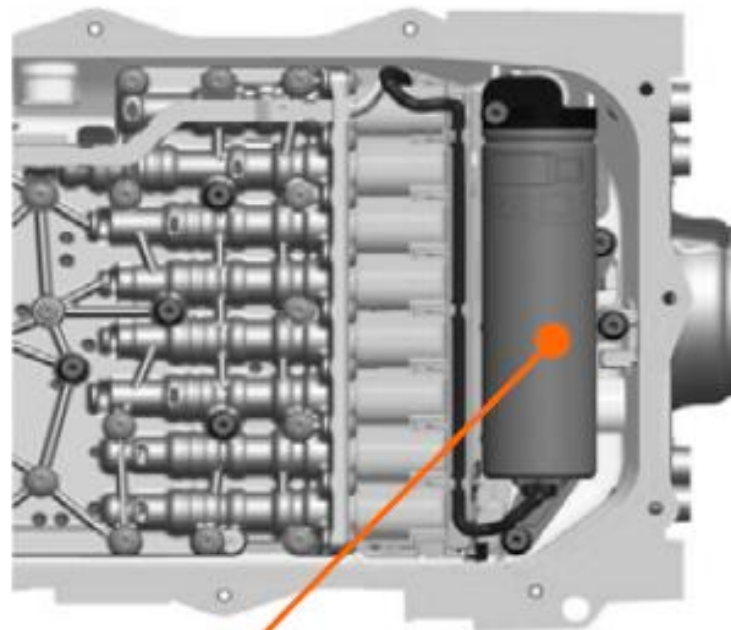
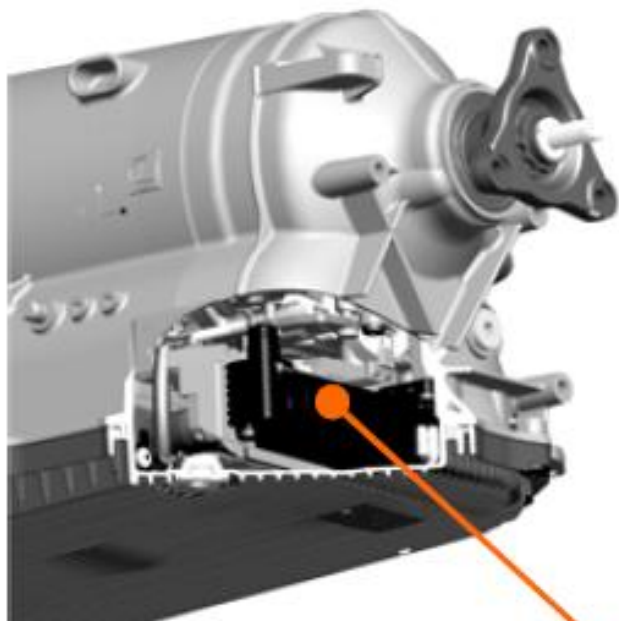
Technical Data: MPR (Manual Park Release)





Technical Data: Stop/Start Unit

- Shuts engine down when vehicle comes to complete stop and conditions are 'right'
- Allows for quick restart of engine and drive away
- Utilizes stored energy in reservoir to 'prime' trans clutches
- Enables virtually instantaneous (<350ms) forward movement with removal of foot from brake



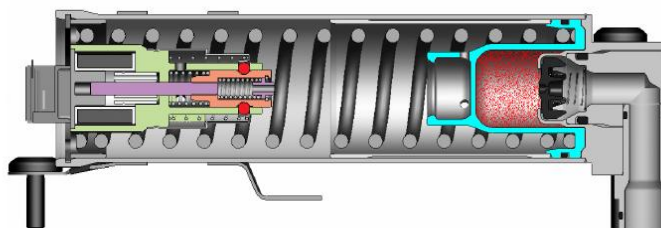
"HIS"



Technical Data: Start Stop Technology

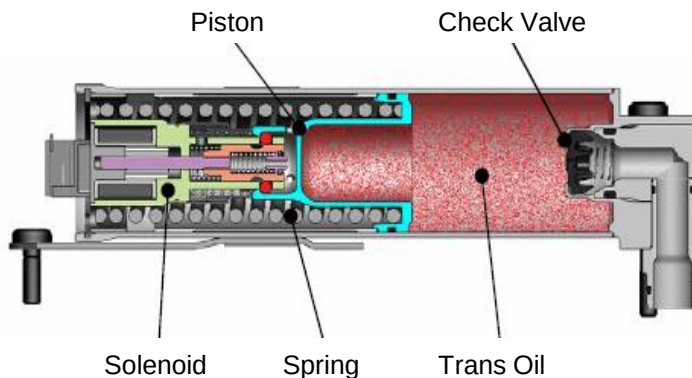
- Fluid is stored during normal operation of vehicle
- Solenoid 'captures' piston and holds until required
- Check valve retains fluid
- Upon request solenoid releases piston, fluid delivered to clutches, and vehicle resumes operation

Actuator in Discharged Position



HIS unit weight: 2.54lbs

Actuator in Charged Position



Technical Data: External Features

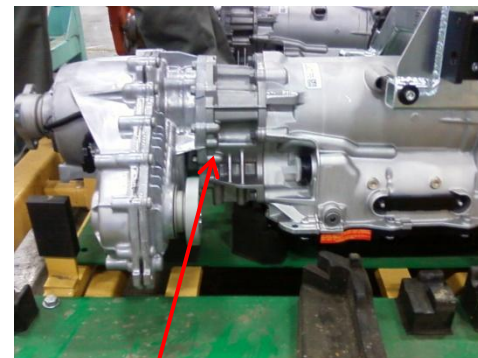
Wire Harness Connection



TOC Line Attachment



AWD Variant



T-Case & Adaptor

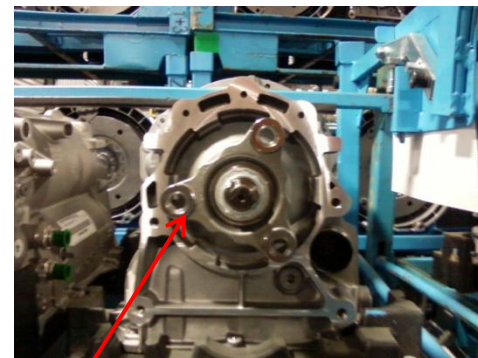
Vent Tube Attachment



Lift Points*



RWD Variant



Flange

*Can also be supported by oil pan for in-vehicle removal



Service Considerations

- ☐ **Special Tools: >95% of special tools required by dealerships are already available through Mopar Service**
- ☐ **Mechatronic assembly can be removed/serviced while trans is in vehicle**
- ☐ **100% electronic transmission results in greater library of fault codes, better diagnostics, ease of diagnosing issues**
 - Communication with customer vehicles via wiTech at Chrysler Dealers
- ☐ **Plastic oil pan with integrated filter**
- ☐ **100% of service parts from ZF are disclosed/available through Mopar Distribution Network via ZF Vernon Hills, Illinois**
- ☐ **Authorized Chrysler Dealership Network technicians are completely trained up to Service Level III on 8HP45 transmissions**
- ☐ **Remanufacturing of transmissions has been allocated to ZF North America**